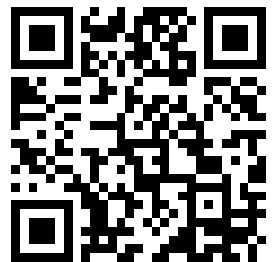

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NGB 1383

NATIONAL GUARD BUREAU MANUAL

TRAINING PROJECTS
OUTLINES
FIREFIGHTER AIRCRAFT
CRASH RESCUEMAN
SSN 1383

NATIONAL GUARD BUREAU • JULY 1950

TRAINING PROJECTS
OUTLINES
FIREFIGHTER AIRCRAFT
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NATIONAL GUARD BUREAU

JULY 1950

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HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

INTRODUCTION AND ORIENTATION

1. PURPOSE.

To acquaint you with the purpose, policies, and organization of the Department of Fire Fighting and Crash Rescue Training.

To familiarize you with the instruction and grading method used in this course.

To teach you the purpose and use of Technical Order OO-5-1.

To teach you the procedure for accomplishing the Individual Run and Crash Reports.

2. EQUIPMENT.

Charts:

Organization, Base Unit.

Protection, Comparison, War and Fire.
DA AGO Form 5-1, Individual Run Report.

DA AGO Form 5-4, Individual Crash Run Report.

3. REFERENCES.

TO OO-1-1—Numerical Index of Technical Publications.

TO OO-1-2—Alphabetical Index of Technical Publications.

TO OO-5-1—Technical Order, Supply Catalog (Stock List) and Special Publications System.

4. INFORMATIONAL PROCEDURE.

a. The Base Commander has the overall responsibility. The Installation's Fire Marshal is responsible for Fire Protection and Aircraft Crash Rescue. He may delegate authority to one or more assistant fire marshals.

b. The Installation Fire Chief is responsible for operation of Fire Protection and Aircraft Crash Rescue. He may delegate authority to one or more assistant fire chiefs. The Fire Chief is in command of rescue and fire fighting operations until all personnel have been rescued and/or the fire is extinguished.

c. The Crew Chief is responsible for the

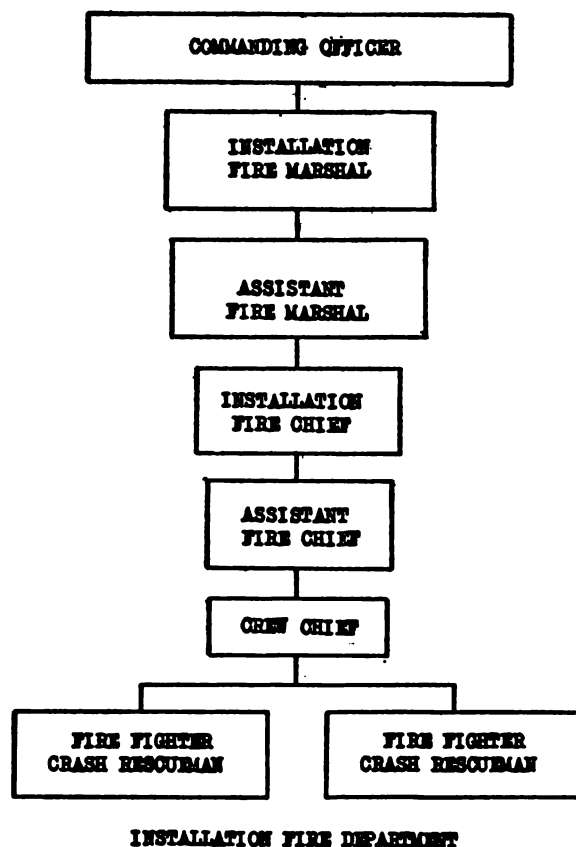


Figure 1.

FOR TRAINING PURPOSES ONLY

operation and specified maintenance of an individual unit, composed of one truck and assigned personnel.

d. The Fire Fighter and Crash Rescueman is responsible for his Individual job with the fire fighting unit.

e. The training received from this course will enable you to rescue personnel, control and extinguish fires, and instruct these subjects proficiently. It is the primary objective of all fire fighters to save personnel and property. The rescue of personnel is of prime importance and is not confined to any given category of people; it may be men, women or children.

The policy of the Air Force, to maintain a high degree of efficiency in the fire fighting personnel, is to perpetuate a scheduled training program and maintain daily records on training charts.

To understand the importance of Fire Protection in the Air Force, the following definitions are given:



Figure 2. Three branches of fire protection.

f. FIRE PREVENTION is the branch of fire science which establishes standards and prescribes practices for the prevention of accidental and unintentional fires. The standards and prescribed practices are controlled by frequent inspections. It is the responsibility of the Fire Protection and Aircraft Crash Rescue Organization to make these inspections.

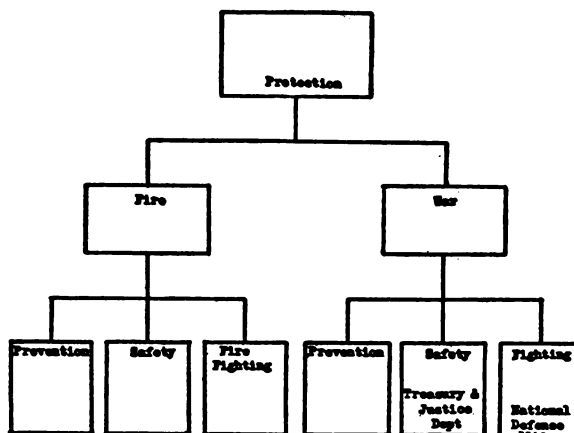
FIRE SAFETY is the branch of fire science which establishes standards and prescribes practices for the escape of personnel under fire and emergency conditions. The standards and prescribed practices are controlled by frequent inspections and tests. It is the responsibility of the Fire Protection and Air-

craft Crash Rescue Organization to make these inspections.

FIRE FIGHTING is the branch of fire science which establishes standards and prescribes practices for the rescue of personnel and control and extinguishment of fire. The standards and prescribed practices are controlled by frequent inspections and tests. It is the responsibility of the Fire Protection and Aircraft Crash Rescueman Organization to give on-the-job training for fire fighting personnel.

It can be conceived from the above information that, whenever fire prevention fails, FIRE is inevitable; when fire safety fails, LIFE is in jeopardy: then it becomes the mission of the fire fighting branch to correct these situations. To correct these situations, it is necessary to emphasize FIRE SAFETY AND FIRE PREVENTION.

The importance of Fire Protection may be shown by comparing War and Fire Protection. (Fig. 2.)



Protection, Comparison, War & Fire

Figure 3.

The purpose of the Department of Fire Fighting and Crash Rescue Training is to train Air National Guard personnel in aircraft crash, structural, natural cover fire fighting, emergency rescue, standardize fire fighting and rescue procedures, and conduct on-the-job training, using developmental

teaching principles. To accomplish this, the Fire Fighting and Crash Rescue Instructor Course is established in three separate branches.

STRUCTURAL FIRE FIGHTING (20 hours)

g. In the Structural Fire Fighting Branch, you will acquire necessary and valuable knowledge which will enable you to train others successfully, intelligently, and safely in the practical problems involved in structural fires.

Your training in the Structural Fire Fighting Branch will consist of the following:

- (1) Introduction and Orientation.
- (2) Class 750 Pumper Truck, Fire Department Hydraulics, and Protective Equipment.
- (3) Class 500 Pumper Truck.
- (4) Class 325 Pumper Truck.
- (5) Interior Fires, Types of Buildings, Forcible Entry and Preservation of Evidence.
- (6) Exterior Fires.
- (7) Gasoline Tank, Automobile and Natural Cover Fires.

CRASH FIRE FIGHTING (30 hours)

h. Your training in the Crash Fire Fighting Branch will consist of the following:

- (1) Class 110 Crash Truck.
- (2) Class 125 Crash Truck.
- (3) Class 150 Crash Truck.
- (4) Class 155 Crash Truck.
- (5) Single Engine Aircraft, including Jet Engine.
- (6) Two-Engine Aircraft, including Jet Engines.
- (7) Four-Engine Aircraft, including Jet Engines.
- (8) Four-Engine Aircraft (MB—similar to B-29), including Jet Engines.
- (9) Six-Engine Aircraft.
- (10) Two-, Four-, and Six-Engine Aircraft Operating Under Night Conditions.

FUNDAMENTALS OF TEACHING (30 hours)

i. Your training in the Fundamentals of Teaching for on-the-job training will consist of the following:

- (1) Training Project Demonstration.
- (2) Introducing the Lesson Project.
- (3) Supervising the Project Study Period.
- (4) Checking the Study Period.
- (5) Discussion.
- (6) Demonstration.
- (7) Accomplishment of Training Project Outline.
- (8) Evaluation of Training Project Outline.
- (9) Critique of Student Accomplishment.
- (10) Development of On-the-Job Training Course.
- (11) Aids to Training.
- (12) Student Evaluation.
- (13) Planning and Developing Training Project Outlines.
- (14) Practical Application of Developmental Teaching Methods.

j. The instructional methods used in the course will be of the type which will create the greatest student participation.

The training Project Outlines (TPO's) are used in all phases and present problems to be accomplished that will parallel as near as possible, the work you will perform.

Training Project Outlines will be taught in the following manner:

- (1) Introduction.
- (2) Supervised Study.
- (3) Checking the Study Period.
- (4) Discussion and Demonstration.
- (5) Accomplishment of the Work Project.
- (6) Individual Instruction.
- (7) Evaluation.
- (8) Critique.

**LISTEN TO AND OBSERVE
ATTENTIVELY ALL PRACTICAL
DEMONSTRATIONS. OBSERVE ALL
SAFETY PRECAUTIONS**

k. The grading method is known as the point system. It is based on the following scales:

Scale value

Interpretation

- | | |
|---|---|
| 5 | Superior understanding of information presented and/or completion of the assignment quickly and efficiently. Learned what to do, how to do it, and the relationship of the project to others studied in the unit. |
| 4 | Above average understanding of information presented and/or completion of the assignment with little hesitancy. Learned what to do and understood generally the underlying principles. |
| 3 | Average understanding of information presented and general idea of what was to be done. Finished the assignment but with minor errors of omission or commission. Made false starts, changes, and repetitions. |
| 2 | Below average understanding of the information presented and lacks sufficient knowledge and/or dexterity to complete the assignment. Additional instruction required. |
| 1 | Inferior understanding of information taught. Could not complete the assignment with major assistance from the instructor. |

l. Grades will be given in whole numbers for each TPO. Phase, written, and practical grades will be carried out to one decimal. Practical examinations will be given in Structural and Crash Fire Fighting phases. Written examination will be given in the Fundamental of Teaching phase. The final grade is determined by averaging all project grades. Final phase and course grade will be based on the following percentages:

STRUCTURAL FIRE FIGHTING

Daily (TPO) grades—70 percent

Practical test—30 percent

CRASH FIRE FIGHTING

Daily (TPO) grades—70 percent

Practical test—30 percent

FUNDAMENTALS OF TEACHING

Daily (TPO) grades—70 percent

Written test—30 percent

The course final grade is determined as follows:

Structural fire fighting—33⅓ percent

Crash fire fighting—33⅓ percent

Fundamentals of teaching—33⅓ percent

m. Technical Orders are official publications which are compiled and distributed in loose-leaf form by the Air Material Command, Wright-Patterson Air Force Base, Dayton, Ohio. These publications contain specific directives and technical information covering the assembly, operation, storage and maintenance of all equipment and materials used in the Air Force.

All Technical Orders covering equipment contain the following information:

- (1) A general description which includes photographs, diagrams and proper nomenclature for all parts.
- (2) Detailed instructions for assembling the equipment.
- (3) Detailed instructions for operating the equipment.
- (4) Detailed instructions for storing, maintaining and repairing the equipment.
- (5) A list of all parts showing part number, nomenclature, property classification and how many of each part goes into the assembly.

A list of all the Technical Orders is published in the Numerical Index of Technical Publications (T.O. OO-1-1). This basic index is kept up to date by a supplement which is issued every two weeks.

In addition to the basic index, an Alphabetical Index (T.O. OO-1-2) is published and made available to aid inexperienced personnel in determining the Technical Order number of a specific item of equipment. This index is divided into four sections. Sections one and two contain the listing of publica-

tions on aircraft and aircraft engines. Section three lists all the other publications on equipment and accessories. Section four is a topical index of captions and headings used throughout the other sections of the index which has been included solely for the purpose of making the entire index easier to use.

With few exceptions, all Technical Orders are identified by a number consisting of three parts, such as TO 19-25A-47, TO 19-25A-49, etc. The method of applying numbers to the publications is as follows:

- (1) All Air Force equipment and materials of a similar nature are grouped together and each group is assigned a number. For example, all aircraft instruments are placed in Class 05, all ground servicing, vehicles, marine and motorized equipment are grouped in Class 19: etc. This, then, is the number which forms the **FIRST PART** of the three-part number which appears on all ground servicing, vehicles, marine and motorized equipment Technical Orders.
- (2) The **SECOND PART** of the three-part number identifies the particular subdivision of the class to which the Technical Order applies: i.e., 05-30 applies to altimeters in the aircraft instrument class; 19-25A applies to fire trucks and associated equipment in the ground servicing, vehicles, marine and motorized equipment class. Alphabetical letters are occasionally added to this second part to segregate further the equipment covered.
- (3) The **THIRD NUMBER** of the series identifies a specific item in the subdivision of a group; i.e., 05-30-7 is written specifically about the B-11 altimeter; 19-25A-47 contains information on the operation and maintenance instruction for fire pump, GF 60 (American-Marsh).

The first step in locating any technical information in the basic index is to properly classify the subject, that is, determine the property class containing the item about which information is desired. A list of the property classes is contained in the table of contents of the index and should be used at any time that doubt exists to which class an item belongs.

The instructor will conduct a discussion concerning the informational procedures just read. Ask questions on any points that are not clear.

An important duty of a Fire Fighter and Crash Rescueman is the compilation of required reports. The thoroughness and accuracy of these reports cannot be overstressed. These forms furnish higher authorities with complete details concerning the adequacy of fire prevention, fire safety and fire fighting equipment and training.

Two two forms that the Fire Fighter and Crash Rescueman will complete are:

- (1) The Individual Run Report (DA AGO Form 5-1) (pages 10 and 11).
- (2) The Individual Crash Fire Report (DA AGO Form 5-4) (pages 12 and 13).

n. The following questions will be used by the instructor as a basis for determining points in the Informational Procedure that may need clarification.

- (1) What is the responsibility of the Fire Marshal?
- (2) Who is responsible for operation and specified maintenance of an individual unit?
- (3) What is Fire Prevention?
- (4) Why should emphasis be placed on Fire Safety and Prevention?
- (5) What two forms are completed by the fire fighter and crash rescue?
- (6) What is the purpose of Technical Orders?
- (7) Explain what each of the three sections of a Technical Order number indicates.

5. PRACTICAL PROCEDURE.

a. You will be conducted on a familiarization tour of the Department of Fire Fighting and Crash Rescueman by your instructor. He will stress points to be observed in the areas, location of the offices, drinking fountains, latrines, clothing and drying room, and supply room.

b. Upon returning to the classroom, the instructor will conduct a critique of the points observed on the tour and of the entire TPO.

c. Accomplish the Individual Run Report (DA AGO 5-1). Refer to the sample form in the informational Procedure. Use the following information and any additional information you deem necessary to complete the form.

- (1) Fire Truck, 750 Pumper.
- (2) Alarm Time, 0830 Hours.
- (3) Fire Phone, 17.
- (4) Location, Building 222.
- (5) Caused by grass fire spreading to trash under building.
- (6) Hydrant No. 10.

d. Accomplish the Individual Crash Fire Report (DA AGO 5-4). Refer to the sample form in the Informational Procedure. Use the following information and any additional information you deem necessary to complete the form.

- (1) Crash Fire Trucks, 125, 150 and 155.
- (2) Weather, fair.
- (3) Temperature, 65 degrees.
- (4) Humidity, 10%.
- (5) Wind direction, northwest.
- (6) Velocity, 15 mph.
- (7) Type of aircraft, B-29.

6. EVALUATION (Self).

a. Is a form required to be filled out whenever a crash fire occurs?

b. Where is the Individual Run Report kept on file?

c. What are the three branches of Fire Protection?

d. How long is the Individual Run Report retained by the Fire Company?

e. How often should forms be filled out on a Run and Crash Fire?

f. What section of the Technical Order Index lists the Technical Orders on ground servicing, vehicles, marine and motorized equipment?

g. What is the number of the Technical Order which is the basic index of all Technical Orders?

7. CRITIQUE.

The instructor will conduct a critique of this training project outline and will use the most effective means of summarizing the following key points:

- a. The organization of a Base Unit.
- b. Organization of Fire Protection and Aircraft Crash Rescue Unit.
- c. Responsibility for Fire Protection and Aircraft Crash Rescue activities at Base Level.
- d. Objectives of Fire Fighters and Crash Rescueman Instructor's Course.
- e. The importance of on-the-job training in maintaining a high degree of efficiency for fire fighting personnel.
- f. Importance of fire prevention, fire safety, and fire fighting activities within the Air Force.
- g. The importance and value to individuals in attaining a high grade in this school.
- h. The importance of understanding thoroughly the grading method used in grading students.
- i. Importance and use of technical orders and index.
- j. Importance of supplying correct information on Individual Run Report and Individual Crash Fire Report.

FIRE DEPARTMENT INDIVIDUAL RUN REPORT				POST Lowry Air Force Base			
TYPE OF TRUCK Class 750 Pumper		REGISTRY NO. 504888		STATION NO. 1		DATE 1 Jan 50	
ALARM DATA				TIME RESPONDED			
RECEIVED FROM <input checked="" type="checkbox"/> Box No. 000 <input type="checkbox"/> Phone <input type="checkbox"/> Other				TO FIRE A.M. 1620 P.M.		TO COVER—IN A.M. P.M.	
TIME RETURNED TO STATION		TOTAL TIME OUT		MILEAGE			
A.M.	P.M.	HOURS	MINUTES	IN	OUT	TRAVELED	
	1700		40	887	876	11	
LOCATION OF FIRE OR ORIGIN OF ALARM Building 840'							
DESCRIPTION OF PROPERTY INVOLVED Warehouse 1 Story Frame							
CLASSIFICATION OF ALARM							
FIRE				NO FIRE			
<input checked="" type="checkbox"/> In Building <input type="checkbox"/> In Brush, Grass, Rubbish, etc. <input type="checkbox"/> In Vehicle <input type="checkbox"/> In Brush, Grass, Rubbish near Bldg. <input type="checkbox"/> In Airplane <input type="checkbox"/> Other (Specify)				<input type="checkbox"/> Rescue or Emergency <input type="checkbox"/> Accidental Alarm <input type="checkbox"/> Plane Crash (Standby) <input type="checkbox"/> Other (Specify) <input type="checkbox"/> False Alarm			
EQUIPMENT USED OR CONSUMED							
NUMBER	AMOUNT	ITEM	NUMBER	AMOUNT	ITEM		
	Unit	2½-gallon Soda-Acid		Lines	Booster Hose		
	Unit	2½-gallon Foam		Ft.	1½-inch Hose		
	Unit	2½-gallon Pump Tank	200	Ft.	2½-inch Hose		
	Unit	5-gallon Pump Tank		Ft.	Ladders		
	Unit	15-pound Carbon Dioxide		Lb.	Foam Powder		
	Unit	50-pound Carbon Dioxide		Gal.	Foam Solution		
	Gal.	Carbon Tetrachloride		Lb.	Calcium Chloride (Nonfreeze)		
	Unit	40-gallon Soda-Acid			(Other)		
	Unit	40-gallon Foam			(Other)		
		(Other)			(Other)		
HOSE LINE							
		FT. LINE	INCH HOSE	INCH NOZZLE	HOUR	MINUTE	
Line 1	Hydrant						
	Pumper	200	2 1/2	1		5	
	Booster						
Line 2	Hydrant						
	Pumper						
	Booster						
Line 3	Hydrant						
	Pumper						
	Booster						
WORKING TIME OF PUMPER		ESTIMATED QUANTITY WATER USED					
HOURS	MINUTES	GALLONS	HYDRANT	PUMPER	BOOSTER		
	5	1250	54	1250			

W. D., A. G. O. Form No. 5-1
1 December 1944

This form supersedes W. D., A. G. O., Form 5-1, 4 September 1944, (Old W. D., A. G. O., Form 412)
which may be used until existing stocks are exhausted.

1-127 10-11006

Figure 4.

EQUIPMENT DAMAGED OR DESTROYED		
None		
EQUIPMENT LOST OR FOUND		
None		
PERSONNEL ON DUTY WHEN ALARM RECEIVED		
Smith, Brown, Mitchell, Adams.		
PERSONNEL NOT RESPONDING—REASON		
None		
OFF-DUTY PERSONNEL RESPONDING		
None		
MECHANICAL PERFORMANCE OF VEHICLE		
Good		
REMARKS (Indicate Accident, Injury, Fatality, Etc.):		
None		
OPERATION OF UNIT AND STORY OF CALL		
<p>Give complete essential details as briefly as possible, including sequence of operations, exact location, observations as to origin and progress of fire, untoward happenings, etc. Information of value in final investigation by board of officers is essential. Where appropriate, make sketch showing location of hydrants, pumper, hose lines, and other operations with respect to building, or buildings, involved.</p>		
<p>The alarm was received at 1620. We responded immediately to the building number given, which was building 841. When approaching we saw smoke. A 2 1/2 line was layed and the pumper connected to hydrant 54. The fire was under control within two minutes. Estimated damage has not been received at this time.</p>		
<p>SKETCH</p>		
<p>SUBMITTED BY W.B. Smith</p>	<p>CLASSIFICATION Crew Chief</p>	<p>DATE 1 Jan 50</p>
<p>CHECKED BY</p>	<p>TITLE (Chief or Assistant Chief)</p>	

Figure 5.

REPORT No. <u>10</u>		INDIVIDUAL CRASH FIRE REPORT				DATE OF REPORT: <u>14 June 1949</u>	
TO—					POST <u>LAMB</u>		
LOCATION OF EMERGENCY <u>Runway 12 East End</u>							
DISTANCE FROM APPARATUS AT TIME OF EMERGENCY <u>1 mile</u>							
INDICATE CLASSIFICATION OF ALARM <input type="checkbox"/> NO FIRE <input checked="" type="checkbox"/> FIRE <input type="checkbox"/> FLIGHT EMERGENCY CRASH <input type="checkbox"/> TAXI EMERGENCY <input type="checkbox"/> LINE EMERGENCY							
DATE AND TIME OF EMERGENCY <u>14 June 49</u>		TIME OF ALARM <u>0730</u>		TIME FIRST APPARATUS ARRIVED <u>0732</u>		TIME FIRE OUT <u>0733</u>	
ANY DELAY OR FAILURE IN RECEIPT OF ALARM <u>None</u>				ELAPSED TIME HOURS MINUTES <u>3</u>			
EQUIPMENT							
HOW WAS EACH UNIT OF EQUIPMENT NOTIFIED RESPONSE BY CLASS IN ORDER OF ARRIVAL EQUIPMENT ON FIELD NOT RESPONDING BY CLASS EQUIPMENT FAILURES DAMAGE TO EQUIPMENT BY FIRE OR OTHERWISE		CRASH TRUCKS		PUMPERS		AUXILIARY EQUIPMENT	
		<u>Crash Alarm System</u>		<u>Fire Phone</u>			
		<u>class class class</u> <u>125 150 155</u>		<u>500 Pumper</u>			
		<u>class</u> <u>110 in motor pool</u>					
		<u>None</u>					
<u>None</u>							
FIRE FIGHTING PERSONNEL							
WHO COMMANDED FIRE FIGHTERS <u>Chief Moore</u>				FIRE FIGHTERS RESPOND. <u>21</u>		ON DUTY NOT RESPOND. <u>None</u>	
						OFF DUTY RESPOND. <u>None</u>	
ANY FAILURE IN RESPONSE OF PERSONNEL <u>None</u>							
FACTUAL DATA							
TYPE OF AIRCRAFT <u>C 47</u>				AIRCRAFT IN USE AS <u>Navigator Training</u>			
GASOLINE QUANTITY INVOLVED <u>300 gallons</u>				NATURE OF GROUND SURFACE <u>Concrete Runway</u>			
OTHER MATERIALS (Bombs, Ammunition, Corps, etc.) <u>None</u>							
CAUSE OF EMERGENCY (In detail if known) <u>Engine Fire</u>							
NATURE OF EMERGENCY <u>Broken fuel line</u>							
WHAT WERE CONDITIONS UPON ARRIVAL OF CRASH CREWS (In detail) <u>Fire on ground and in accessory section</u>							
WEATHER		GENERAL <u>Fair</u>		TEMPERATURE <u>65</u>		REL. HUMIDITY <u>10 %</u>	
				WIND DIRECTION <u>West</u>		VELOCITY <u>10 mph</u>	
ESTIMATED COST OF DAMAGE <u>\$1,000.00</u>				POINT OF ORIGIN OF FIRE <u>Right Engine</u>			

EXTINGUISHING AGENTS USED						
QUANTITY	UNIT	ITEM	QUANTITY	UNIT	ITEM	
	GAL.	WATER (Low pressure)		LBS.	FOAM POWDER	
	GAL.	WATER (High pressure)		GAL.	FOAM SOLUTION FOAM NOZZLE	
	LBS.	CO ₂ (High pressure)	400	GAL.	FOAM SOLUTION FOG NOZZLE	
1,000	LBS.	CO ₂ (Class 100)	400	GAL.	CTC	
		OTHER (Specify)			OTHER (Specify)	

RESCUE						
TOTAL NUMBER OF PERSONNEL IN AIRPLANE	UNINJURED	INJURED	UNBURNED	MINOR BURNS	SERIOUS BURNS	
5	5	0	5	0	0	
NUMBER ESCAPED UNAIDED	5	0	5	0	0	
NUMBER RESCUED ALIVE	0	0	5	0	0	
NUMBER REMOVED DEAD						

HOW RESCUED	TOOLS USED None	CLOTHING Bunking	HOSE LINE PROTECTION Foam and Foam-Fog
-------------	---------------------------	----------------------------	--

EXTENT OF INJURIES TO PERSONNEL IN AIRPLANE
None

ANY INJURY OR LOSS OF LIFE TO OTHER PERSONNEL
None

PRECAUTIONARY MEASURES AND COMMENTS

PRECAUTIONARY MEASURES TAKEN TO PREVENT FURTHER DAMAGE FROM FIRE AFTER EMERGENCY
Broken gasoline line was dropped. Gasoline on ground, covered with foam.

COMMENTS AND RECOMMENDATIONS

Crash Fire and Rescue Units should have been notified when aircraft was approaching the base.

"Recommend" fire department be notified before landing is made

NARRATIVE REPORT

DETAIL ENTIRE ACTION OF THE FIRE DEPARTMENT (Continue on separate sheet and include sketch)

Alarm was received at 0730. Response was immediate. The C-47 had allready landed and was at the end of Runway 12. The fire was controlled and extinguished immediately.

SIGNATURE OF OFFICER IN CHARGE OF CRASH FIRE FIGHTING /s/ R.R. Lowes R.R. Lowes, Chief	SIGNATURE OF COMMANDING OFFICER
--	---------------------------------

★ U. S. GOVERNMENT PRINTING OFFICE

Figure 7.

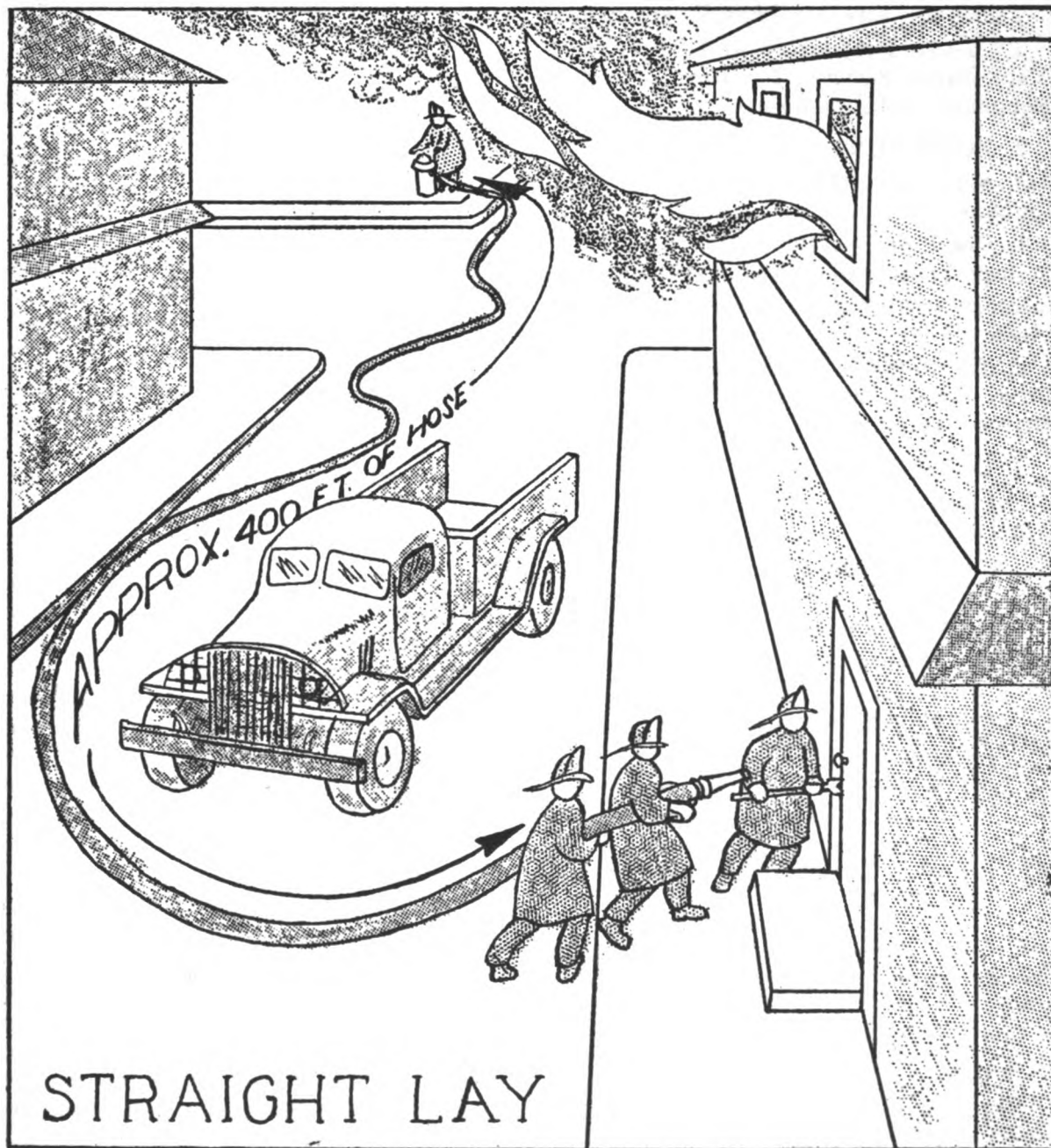
8. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student correctly use the supplied information in accomplishing DA-AGO Form 5-1?			
2. Did the student supply additional correct information in accomplishing DA-AGO Form 5-1?			
3. Did the student correctly use the supplied information in compiling DA-AGO Form 5-4?			
4. Did the student supply additional correct information in accomplishing DA-AGO Form 5-4?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

CLASS 750 PUMPER TRUCK



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you the identification, operation, (including individual duties of crew members) and inspection and maintenance (including polar) of the Class 750 Pumper Truck.

2. REFERENCE.

TM 5-692, Fire Department Techniques.

TM 5-687, Inspection and Preventive Maintenance Services for Fire Protection Equipment and Appliances.

3. EQUIPMENT

a. One Class 750 Pumper Truck fully equipped.

b. One Hose Loader.

c. TF 11-553, Motor Vehicle Driver's Elementary Instruction and Inspection (25 minutes).

d. TF 10-2054, Motor Vehicle Driver's First Echelon Maintenance Designed for Drivers (20 minutes).

4. INFORMATIONAL PROCEDURE.

For identification, read paragraph b, pages 3 and 4, TM 5-687.

EVALUATION (Self)

- (1) What is the capacity of the Class 750 Pump at 200 p.s.i.?
- (2) What type of pump is mounted on the Class 750?
- (3) What is the capacity of the booster tank?
- (4) How many fifty-foot sections of 2½-inch hose are carried on the Class 750?
- (5) What is the length of the booster line?

b. Your Instructor will preview TF 11-553 on procedures for driving truck (25 minutes).

Instructor will show film.

Instructor will review film.

Evaluate your understanding of procedures shown in the film by answering these questions:

- (1) When did the operator set the brake in the film?
- (2) What gear was selected when moving truck forward?
- (3) What procedure was followed before traveling over rough terrain? When starting up inclines?
- (4) What precautionary measures were taken when parking down-grade? When parking up-grade?
- (5) What precautionary measure was taken when backing truck?
- (6) What method was used in slowing truck preparatory to stopping before applying brakes?

c. Your Instructor will demonstrate driving of the Class 750 Pumper Truck.

- (1) Starting, moving forward, and shifting of gears.
- (2) Stopping, using engine to reduce speed, and applying foot brake and emergency brake.
- (3) Backing of truck and importance of outside guide.

d. The Class 750 Pumper is equipped with a 750 g.p.m., two stage, pressure-volume type centrifugal pump. In order to identify this pump as a pressure-volume (series-parallel) pump, it must be equipped with a change-over valve. This valve changes the pump from pressure (series) to volume (parallel) operation as the requirements for engine pressure dictate. For example, on long hose lays, the pressure (series) position is selected, and on short or medium lays, the volume (parallel) position is used.

Pump controls and gauges are located at the "pump operator's station" midship of the truck on the left side of the vehicle.

The pump is driven by the vehicle's engine through a special pump transmission. When the pump is equipped with rotary gears, the same transmission is utilized for the fire pump as for priming purposes. Pumpers which are not equipped with rotary gear pumps for priming, utilize the vehicle engine

for reducing air pressure in the pump and suction line. This is accomplished by connecting the pump to the intake side of the engine.

The 750 centrifugal pump is equipped with a change-over valve, pressure and compound gauges, vacuum pump or engine priming devices. It is also equipped with either an automatic relief valve or pressure regulator. The word "relief" valve, as the word implies, relieves the pressure at a predetermined pressure. The relief valve should have a predetermined pressure setting of 120 p.s.i. Whenever the pump is needed, a minimum loss of time is encountered in either raising or lowering the pressure from this predetermined setting. This information is beneficial to crew chief and nozzleman for control and use of nozzle stream pending time required for proper setting.

The regulator controls the engine pressure by regulating engine r.p.m. and is connected from the discharge side of the pump to the carburetor. The pressure regulator, when spring tension is utilized, should also be set at 120 p.s.i. when truck is not in use at the fire station. When pressure regulator is of the hydraulic-diaphragm type, this procedure does not apply as water under pressure must be present for operation and setting. Except for priming, the procedures for operating all Class 750 centrifugal pumps are similar whether operating from hydrant or draft. Either the soft or hard suction can be used when operating from hydrant; however, the hard suction must be used when operating from draft.

Preparatory to drafting, remove the hard suction and connect it to the pump, connect strainer to male end of suction, attach rope to suction and/or strainer, submerge strainer and hose, and secure rope to apparatus to prevent strainer from being too close to bottom or surface. Before starting draft operation, make sure that all connections are tight. Before water will be forced into pump, the air pressure must be reduced in the pump and suction hose. This is done

by use of the priming pump or utilizing the intake side of engine through the priming device.

PRIMING THE PUMP. With the engine idling, shift the pump gear shift lever from neutral to prime position. Pull out the primer valve control and engage the priming pump. The engine throttle may now be opened to regulate the engine speed to about 700 to 1200 r.p.m. Similarly, except for placing the priming pump into operation, controls can be pulled to initiate draft by using the engine priming device.

GAUGE. The two gauges are the pressure and the compound gauge. The pressure gauge registers the pressure on the discharge side of the pump, and the compound gauge registers the pressure or vacuum on the suction side; however, where two gauges are used on the centrifugal type pump, both must be of the compound type.

PUMPING. While the pump is turning over, with the engine at idling speed, open the discharge valve to the hose which lines are attached. The desired working pressure, as read on the pressure gauge, is reached by gradually opening hand throttle. After the desired working pressure is obtained, where the relief valve is employed, it may be possible to lower the engine speed slightly. In all cases, run the engine at the lowest speed at which the required pressure can be maintained. Where the pressure regulator is employed, the engine speed is determined by the desired engine pressure, and no further setting is required.

THE AUTOMATIC RELIEF VALVE. The pump operator seldom knows in advance when a hose line is to be shut-down. If a single line is operating from the pump, a sudden closing of the line causes a momentary backing up of the pressure in the pump, and the pressure may be sufficient to rupture the hose line or pump casing. If more than one line is being used and one of the lines is shut down suddenly, the pump may continue to run as long as one line is open, but the pressure built up may be sufficient to

cause a reaction at the nozzle and injure personnel holding it. To prevent this from happening, when the pressure spring tension on the automatic relief valve, the valve opens in order to permit water to flow into the suction side of the pump and relieve the discharge pressure. When the pressure below the setting of the spring, caused by the opening of other hose lines is reduced, the valve closes and the flow from the discharge to suction side ceases.

To set the automatic relief valve, starting from the predetermined setting of 120 p.s.i., back the knurled nut until the pressure on the gauge begins to drop, then screw in until original pressure is restored. Whenever the pressure is changed, this control must be reset in the same manner. Screw the nut in for higher, and out for lower pressure.

PRESSURE REGULATOR VALVE. There are two common types of pressure regulator valves. The pressure regulator valve may be

set to release at a predetermined pressure, and its operation activates by the actual pressure at which the pump is discharging. The pressure regulator valve operates in principal along the same line as the relief valve in that it may be set to release at a predetermined pressure, and its operation is actuated by the actual pressure at which the pump is discharging.

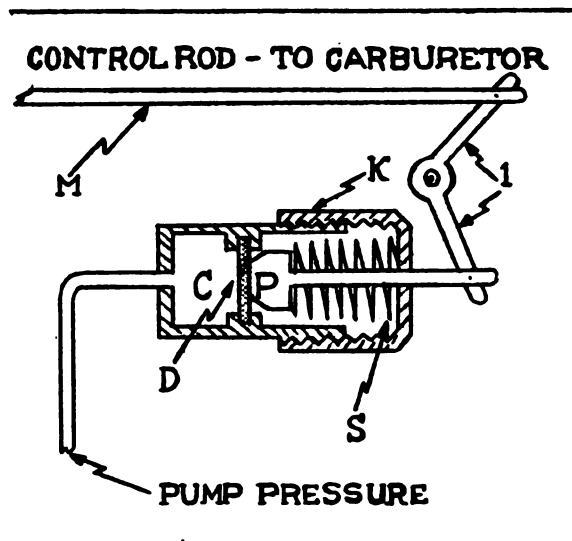


Figure 2.

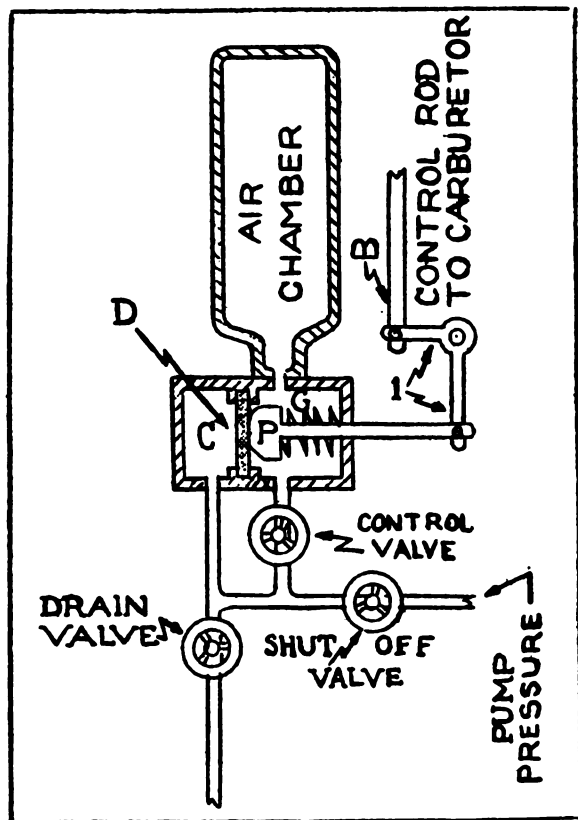


Figure 1.

Figure 1, water at pump pressure enters regulator or governor chamber C and reacts against diaphragm D, against the opposite side of which rests piston P, backed by the compression in spring S. The pressure of the piston against the diaphragm may be increased or decreased as desired by turning screw control cap K, varying the compression in the spring. When the discharge valves are closed, the pump pressure in C increases and overbalances the spring pressure on the other side of the diaphragm, causing the piston to move to the right. Piston P is connected to the carburetor of the motor by a series of rods and levers L and M in such a way that a slight movement of the piston to the right will cause the valve to partially close. When valve partially closes, the fuel supply is reduced, the speed of the motor lessened, and the pump pressure reduced to normal. When

the discharge valves are opened, the pressure in C is reduced and permits the spring to move the piston to the left, thus opening the carburetor valve, speeding the motor and pump, and obtaining the desired pump pressure. When resetting the pressure regulator or governor regulator for standby or at the station, set the regulator at 120 p.s.i. if it is a spring-loaded pressure regulator. Predetermined pressure cannot be set on the hydraulic type.

When pumping from a hydrant, where the desired working pressure is not reached and there is less than 5 pounds of pressure on the compound gauge, no further attempt to increase the pressure should be made. The pump will then be delivering the maximum capacity of the hydrant. Change to smaller nozzle tips or change the cross-over valve from volume to pressure position.

When pumping from draft, where the desired working pressure is not reached and a vacuum of at least 10 inches is showing on the compound gauge, smaller nozzle tips must be used or the cross-over valve must be changed from volume to pressure position.

CHANGING FROM VOLUME TO PRESSURE OR VICE VERSA. When making this change, throttle the engine until the discharge pressure is 25 p.s.i. on the pressure gauge, then turn the cross-over valve control to the opposite extreme. There is no intermediate position for the cross-over valve. Turn it to the one extreme or the other.

TEMPORARY SHUT-DOWN. When temporary shut-down is required, it is not necessary to stop the pump. Close the throttle until the pressure is reduced to approximately 20 pounds. Upon resuming operation, open the throttle until the desired working pressure is again established. (NOTE: The pump operator will not shut down the pump until so ordered by the crew chief).

SHUTTING-DOWN OPERATION. When pumping is completed, shut the pump down by first closing the throttle, then closing all discharge valves and the hydrant, or in the event of drafting, raise the suction strainer

out of the water. Open the bleeder valve on all discharge gates to drain off water. Disconnect suction hose and replace on truck. Replace caps on intake and discharge gates.

RETURNING TO QUARTERS. When the operation is completed and you are ready to return to the station, unlatch the road transmission gear shift lever and shift it to neutral. Shift pump control lever from pump to road position.

PUMPING FROM BOOSTER TANK. When pumping from the booster tank, the same procedure is followed as when pumping from the hydrant. Instead of connecting the suction to the hydrant, open the tank valve. Instead of opening the discharge gate, open booster discharge valve. Following cessation of the pumping operation, decrease the engine speed the same as when pumping from a hydrant. Due to the low discharge and low pressure of the booster nozzle, it is seldom necessary to employ the cross-over valve. Effective engine pressure is approximately 80 to 100 p.s.i.

EVALUATION (Self).

- (1) What operations does the pump operator perform before leaving the cab, when pumping from the hydrant?
- (2) In what gear is the road transmission when pumping?
- (3) To what is the suction connected first, to the pump or hydrant?
- (4) When is the cross-over valve placed in pressure (series) position?
- (5) What type suction hose is used when drafting?
- (6) How is the air drawn from the pump?
- (7) What are the two gauges on the 750 Pumper?
- (8) What is the difference in the function of the gauges?
- (9) At what speed should the engine run while pumping?

- (10) What procedure is used in setting the pressure with the automatic relief valve?
- (11) Why is it sometimes necessary to change to smaller nozzle tips or from volume to pressure when pumping from hydrant?
- (12) What should the pressure be indicated on pressure gauge when change is made from pressure to volume or vice versa?
- (13) What is the approximate pressure to be maintained for temporary shut-down?

HOSE LOAD.

- (1) **ACCORDION.** Read paragraph 21, section c, page 36, and see figure 43, page 35, of TM 5-692.
- (2) **HOSE LOAD FINISH.** For doughnut roll, read paragraph 22, section a, page 36, and see figure 46, page 38, of TM 5-692.
- (3) **STRAIGHT LAY.** Read paragraph 23, section a, page 37, and see figure 48, page 40 of TM 5-692, Positions duties of crew members when making a straight lay.

PLUGMAN. Read paragraph 24, section c, page 38, of TM 5-692.

NOZZLEMAN. The next step in this operation will be performed by the nozzlemen. Read paragraph 24, section d, pages 39 and 42, and see figure 50, page 42, of TM 5-692. Read section b, page 42, and see figure 54, page 45, of TM 5-692, Advancing Hose from Straight Lay.

CREW CHIEF. Directs and assists in the operation. He may remove booster line as outlined in figure 48, page 40, operation No. 1.

PUMP OPERATOR. Places pump in gear for booster operation as outlined in paragraph c. He assists nozzlemen in breaking the line, attaching the nozzle, and advancing the line.

EVALUATION (Self).

- (1) What is the initial operation in commencing a straight lay?
- (2) Where does the plugman alight from truck on the straight lay?
- (3) In what position is the hose laid at the hydrant? How is the hose line held secure?
- (4) Where is the hydrant wrench placed after the cap has been loosened on the hydrant?
- (5) How tight is the hose connection made when screwed to the hydrant?
- (6) Does the nozzleman face the male or female coupling when disconnecting a line?
- (7) What procedure is used by the nozzleman if the coupling cannot be broken by hand?
- (8) What are the duties of the crew chief on a straight lay?
- (9) What are the duties of the pump operator on a straight lay?

Your Instructor will demonstrate with your assistance:

- (1) **HOSE LOAD**, using the accordion load as outlined above.
- (2) **HOSE FINISH**, using the doughnut roll as outlined above.
- (3) **STRAIGHT LAY**, including crew positions, as outlined above.

HORSESHOE LOAD. Read paragraph 21, section b, and see figure 44, page 36, of TM 5-692.

HOSE FINISH. For Skid Load, read paragraph 22, section b, page 37, and see figure 47, page 39.

REVERSE LAY. Read paragraph 23, section b, page 38, and see figure 55, page 46, of TM 5-692, Advancing Hose from Reverse Lay, and figure 65, page 51, of TM 5-692, Positions and duties of crew members when making a reverse hose lay.

NOZZLEMAN. Read paragraph 25, section c, page 42, and see figure 55, page 46 and figure 47, page 38, Dropping the Skid Load.

CREW CHIEF directs the operation. He will assist nozzleman in removing hose and equipment.

PLUGMAN. The plugman will remain on the truck, step to the side rear platform, and proceed to the hydrant. At the hydrant, he will brake the hose line, connect the line to discharge side of pump, and turn on discharge valve. He will assist the pump operator in making a truck-to-hydrant connection.

PUMP OPERATOR performs duties as heretofore outlined.

EVALUATION (Self).

- (1) Where is the horseshoe load started?
- (2) Where is the skid load started?
- (3) How is the skid load started?
- (4) Where is the double male connection located and used when making a reverse lay?
- (5) What are the duties of the nozzleman on a reverse lay?
- (6) What are the duties of the crew chief on a reverse lay?
- (7) What are the duties of the plugman on a reverse lay?
- (8) What are the duties of the pump operator on a reverse lay?

Your Instructor will demonstrate with your resistance:

- (1) **HOSE LOAD**, using the horseshoe load as outlined in paragraph 21, section b, figure 44, page 36, of TM 5-692.
- (2) **HOSE LOAD FINISH**, using the skid load as outlined in paragraph 22, section b, page 37, and figure 47, page 39, of TM 5-692.
- (3) **REVERSE LAY**, as outlined in paragraph 23, section b, page 38, of TM 5-692.

Pumping from draft as outlined in paragraph c, is similar to pumping from hydrant except for priming.

EVALUATION (Self).

- (1) Why should all drains and valves be closed on pump?
- (2) Where should the pumper be positioned when drafting from pit?

Your Instructor will demonstrate the drafting operation as outlined heretofore.

e. Inspection and Maintenance (including polar).

Instructor will preview training film No. TF 10-2054, Motor Vehicle Driver's First Echelon Maintenance Designed for Drivers (20 minutes).

Instructor will show film.

Instructor will review film.

- (1) Before operation inspection.
- (2) During operation inspection.
- (3) After operation inspection.

An inspection of fire trucks will be performed daily, after each run, and weekly. For daily inspection, read paragraph 14, page 10, of TM 5-687.

EVALUATION (Self).

- (1) What is the suggested time for performing daily inspection?
- (2) When should:
 - (a) The fuel tank be refilled?
 - (b) Oil be added to the engine?
 - (c) Water be added to the radiator?
 - (d) the tires be checked and for what?
- (3) How should the battery be checked?
- (4) When should the battery be recharged or replaced?
- (5) What specific gravity reading should be maintained in the battery during sub-zero weather?
- (6) How much free travel should the foot brake and clutch pedal have?
- (7) Why should the drains and valves be closed on the fire pump?

Your Instructor will demonstrate daily inspections as outlined in paragraph 14, page 10, of TM 5-687.

For After-Each-Run Inspection, read paragraph 15, page 11, of TM 5-687.

EVALUATION (Self).

- (1) What procedure is used when dirty or salty water has been pumped?
- (2) What procedure is used when the lining is found to be loose in the suction hose?
- (3) What would cause a slight leak around the packing gland?
- (4) What procedure is used in checking primer-pump oil reservoir?

Your Instructor will demonstrate After-Each-Run Inspection as outlined in paragraph 15, page 11, of TM 5-687. For Weekly Inspection, read paragraph 16, page 12, of TM 5-687.

EVALUATION (Self).

- (1) What procedure is followed in cleaning the battery?
- (2) How far above the battery plates should the water be?
- (3) How is the rust and scale removed from the booster tank?
- (4) What procedure is used for checking the pump?

Your Instructor will demonstrate Weekly Inspection, as outlined in paragraph 16, page 12, of TM 5-687.

5. PRACTICAL PROCEDURE.

You will be assigned as a crew member to a crew of four. You will be further assigned to a position on the Class 750 Pumper Truck.

Operation No. 1

The crew will load the hose bed with 1,000 feet of 2½-inch hose by using the "hose loader" and making the accordion load and the doughnut roll finish as outlined in Informational Procedure. Upon completion of hose load, the crew will make the straight hose lay with each crew member performing his duties as outlined in Informational Procedure. Hose will be reloaded on truck and equipment replaced.

Operation No. 2

Crew will load the hose bed with 1,000 feet of 2½-inch hose by using the "hose loader" and making the horseshoe load and the skid load finish as outlined in Informational Procedure. Upon completion of hose load, crew will make the reverse hose lay, each crew member performing his duties as outlined in Informational Procedure. Hose will be reloaded on truck and equipment replaced.

Operation No. 3

Crew will load the hose bed with 1,000 feet of 2½-inch hose by using the "hose loader" and making the horseshoe load and the skid load finish as outlined in the Informational Procedure. Upon completion of the hose load, the crew will make the reverse hose lay and operate from draft as outlined in Informational Procedure. Hose will be reloaded on truck and equipment replaced.

EVALUATION (Self).

- (1) What is the capacity of the Class 750 pump at 250 p.s.i.?
- (2) How many feet of 2½-inch hose are carried on the Class 750?
- (3) What procedure is followed when backing the truck?
- (4) What type of pump is mounted on the Class 750 Pumper?
- (5) What is your understanding of a two-stage, pressure-volume type centrifugal pump?
- (6) What is the purpose of the cross-over valve?
- (7) What is the procedure for setting an automatic relief valve?
- (8) What are the procedures for setting the pressure regulator valves?
- (9) What are the duties of each crew member when laying a "straight hose lay"?
- (10) What are the duties of each crew member when laying a "reverse hose lay"?
- (11) Where is the horseshoe load started?

- (12) What procedure is followed after dirty or salty water has been pumped?
- (13) What are the parts and points to be inspected and receive maintenance after each run?
- (14) What are the four methods of winterizing the trucks?

6. CRITIQUE.

You will assist in performing inspection and maintenance procedures as outlined in Informational Procedures.

Instructor will conduct a critique of this training project outline and summarize the following key points:

a. Operation of the pump.

- (1) Changing from road to pump gear.
- (2) Changing cross-over valve from volume to pressure position.
- (3) Increasing pressure for long lays.

b. Crew positions and duties on Straight Lay.

- (1) Plugman.
- (2) Nozzleman.
- (3) Crew chief.
- (4) Pump operator.

c. Crew positions and duties on Reverse Lay.

- (1) Nozzleman.
- (2) Crew chief.
- (3) Plugman.
- (4) Pump operator.

d. Position and duties of pump operator when pumping from draft.

e. Hose Loads.

- (1) Accordion Load.
- (2) Horseshoe Load.
- (3) Doughnut Roll Finish.
- (4) Skid Load Finish.

f. Inspection and Maintenance.

- (1) Daily
- (2) After each run.
- (3) Weekly.

You will assist in performing maintenance on hose and equipment used in this project.

7. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did student plugman wait until truck stopped before alighting with hose and plug wrench?			
2. Did student go directly to hydrant, lay hose around hydrant, and hold hose by laying end of hose on top of line and putting foot on top to secure?			
3. Did student loosen hydrant cap with hydrant wrench and place wrench on hydrant valve stem?			
4. Did student connect hose hand tight to hydrant on side toward fire and turn on hydrant valve?			
5. Did student crew chief alight from truck and advance to point of operation with booster line?			
6. Did student nozzleman wait until truck stopped at point of emergency to alight?			
7. Did student remove sufficient hose for working line, disconnect hose coupling, connect nozzle, and advance with line to point of operation?			
8. Did nozzleman alight from truck and pull sufficient working line and nozzle?			
9. Did student pump operator position truck properly at hydrant?			
10. Did student pump operator put pump lever in pump position before leaving driver's seat?			

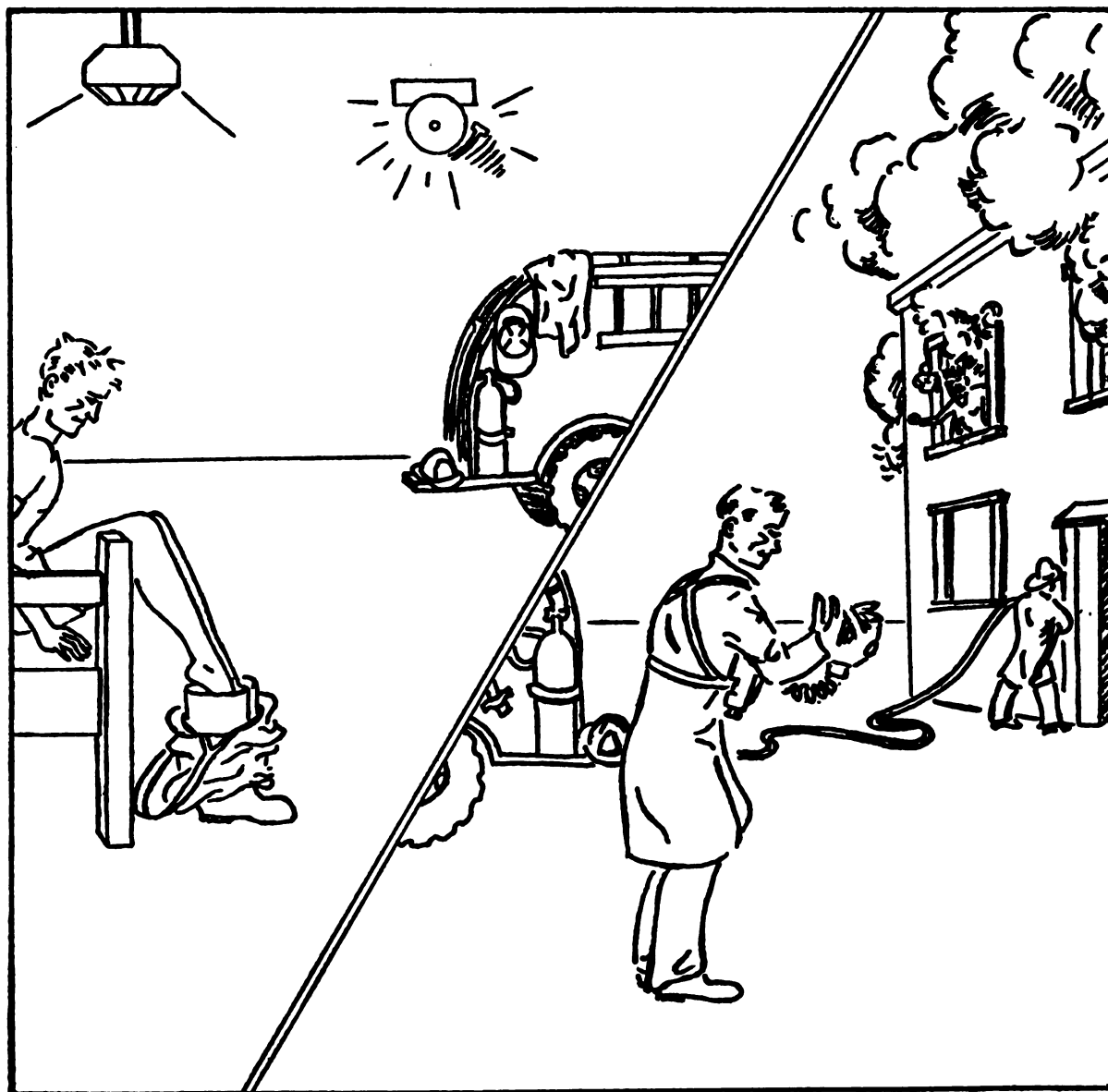
Grading points	Above average + 1	Average 0	Below average - 1
11. Did student pump operator connect suction to truck before connecting to hydrant?			
12. Did student plugman disconnect hose and connect hose to discharge side of pump on the opposite side of truck from hydrant?			
13. After connecting hose to pump, did student plugman observe and correct kinks in hose and leaky couplings while going to point of emergency?			
14. After operation, did every student in crew assist in reloading hose?			
15. Did student assist in performing maintenance to hose and equipment?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

PROTECTIVE EQUIPMENT

PART I



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you donning and care of protective clothing and breathing equipment.

2. EQUIPMENT.

- a. Coat, duck, fireman.
- b. Trousers, fireman, bunking.
- c. Boots, fireman, rubber.
- d. Suspenders, trouser.
- e. Gloves, insert, wool.
- f. Helmet, fireman, plastic.
- g. Hood, protective, fire fighting.
- h. Mask, gas—Special, M2A2; All-Purpose, M1-III-A1.

3. REFERENCE.

TM 5-692.

4. INFORMATIONAL PROCEDURES.

Read paragraph m, page 3, of TM 5-692, regarding protective clothing and equipment. In addition to clothing and equipment listed in paragraph m of TM 5-692 is the hood, protective, fire fighting, and gloves, insert, wool, which are worn by crash rescuemen. The hood replaces the helmet for crash rescuemen.

Protective clothing and equipment must be worn at every crash and fire incident.

Donning of protective clothing is somewhat similar to attiring ones-self with ordinary clothing, except that the coat, gloves, and helmet and/or hood are stored at the designated location on the apparatus and must be donned while enroute to the crash and/or fire. Never release both hands from the truck at the same time while donning clothing enroute. The trousers and boots are stored at the side of the bunk when not in use or being dried. Due to the fact that only one complete set of clothing is authorized, the coat, hood, and gloves must be dried at a designated location near the apparatus, where its use necessitates no delay in responding to the crash or fire. Gloves should be kept in coat pockets except when being dried, and then they will be attached to the uppermost snaps of the coat to prevent their loss during donning.

In donning protective clothing on the apparatus, the garments will be put on in the following order: coat, helmet (or hood), and gloves.

Instructor will demonstrate the donning of protective clothing, starting from the bed:

- (1) Place feet into boots, pull trousers up, place suspenders over shoulders, and proceed to the designated spot on the apparatus.
- (2) While holding on with one hand, put either the right or left arm through the coat sleeve and repeat with the other arm; buckle the coat.
- (3) Place helmet and/or hood on the head and secure the chin strap.
- (4) Slip on gloves.

Protective clothing and equipment should be inspected after each use to determine whether torn or worn places are present. In the case of the hood, further inspection is necessary regarding the condition of the transparent face piece.

All garments of protective clothing should be thoroughly washed with water using a brush. Soap should be used only when necessary. Washing should be followed by placing the garments in a prescribed location for drying and/or storage.

The standard breathing equipment authorized for fire fighting personnel is the mask, gas, special, M2A2, all-purpose, M1-III-A1, and is carried on the apparatus. The mask will protect the wearer against a variety of noxious gases when the oxygen content is above 16%. The all-purpose type canister has a usable and safe life of two hours. On the canister is a space provided for registering each period of use. It is most important to record each use immediately to insure safety to the subsequent wearer.

Instructor will demonstrate donning of mask as follows:

- (1) Remove from apparatus and case.
- (2) Adjust body strap.
- (3) Remove helmet.
- (4) Remove face piece from carrier.

- (5) Place face piece on head.
- (6) Adjust head harness.
- (7) Replace helmet on head.

The mask should be thoroughly inspected after each use in order to determine the serviceability of canister, corrugated tube and face piece, including flutter valve, head harness and body straps.

The mask should be kept thoroughly clean, face piece should be washed very carefully with warm water and mild soap, and rinsed and dried thoroughly after cleaning.

The mask should be stored on apparatus in a dry place.

5. PRACTICAL PROCEDURE.

a. Students will draw the following protective clothing from the Department Supply Unit:

- (1) Bunking coat.
- (2) Bunking trousers.
- (3) Boots.
- (4) Suspenders.
- (5) Gloves.
- (6) Helmet.
- (7) Hood.

b. Students will perform inspection of each garment and don clothing and gas mask as prescribed in informational procedure.

6. EVALUATION (Self).

a. Where are the various components of protective clothing and equipment kept when not in use?

b. When should protective clothing and equipment be inspected?

c. Where should gloves be hung during drying?

d. What is the safe life of an all-purpose gas mask canister?

7. CRITIQUE.

The instructor will conduct a critique of this training project and will use the most effective means of summarizing the following key points:

a. Clothing and equipment worn by fire fighting and crash rescueman.

b. Procedures for donning protective clothing and equipment.

c. Procedures for inspecting protective clothing and equipment.

d. Procedures for cleaning and storing of protective clothing and equipment.

e. Procedure for donning and use of the all-purpose gas mask.

f. Inspection and maintenance of the gas mask.

8. GRADING POINTS.

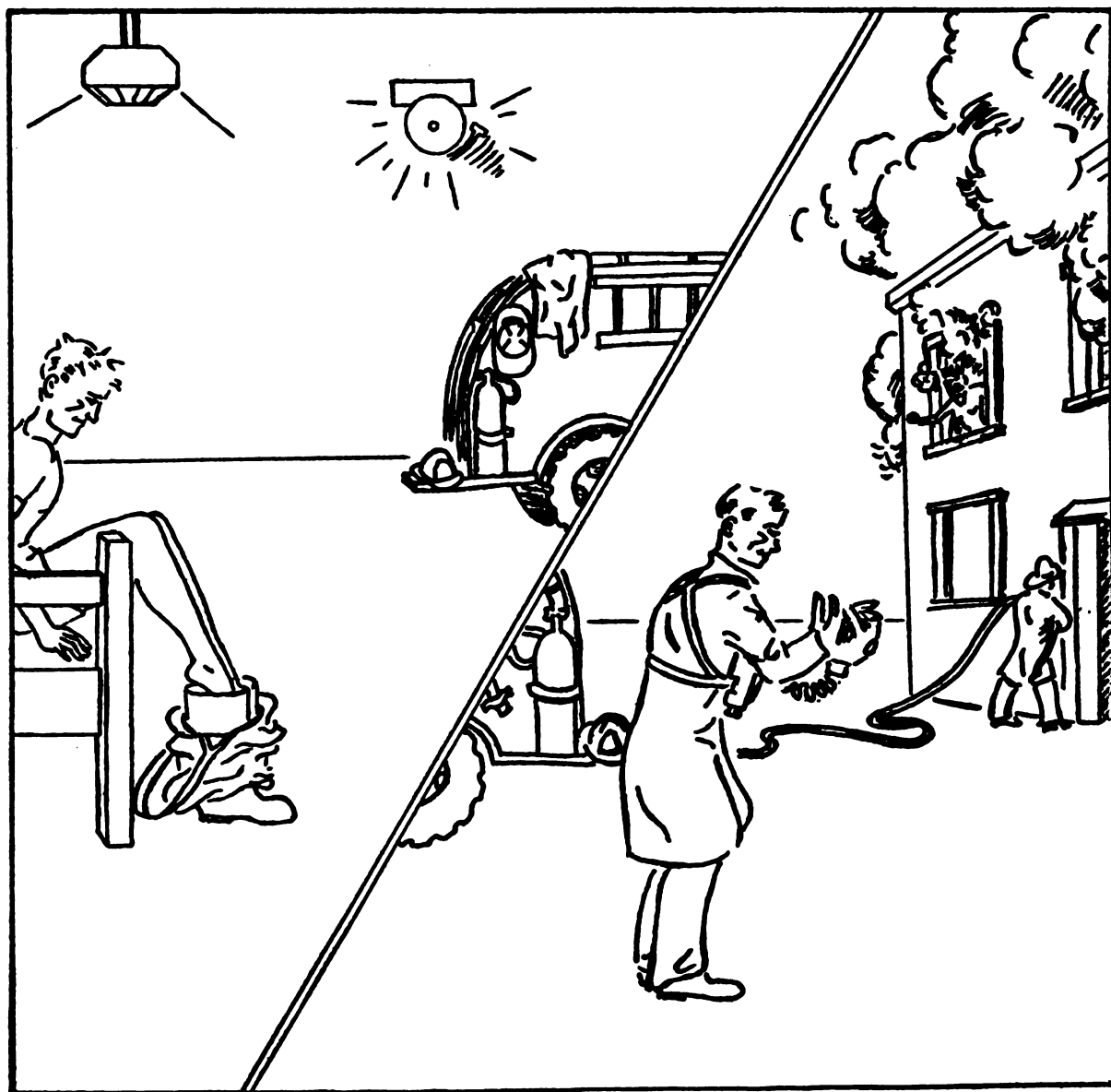
Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student follow correct procedure for donning clothing?			
2. Did the student know how to inspect protective clothing?			
3. Did the student know the value of proper maintenance and storage of protective clothing?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
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3. REFERENCE.

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Protective clothing and equipment must be worn at every crash and fire incident.

Donning of protective clothing is somewhat similar to attiring ones-self with ordinary clothing, except that the coat, gloves, and helmet and/or hood are stored at the designated location on the apparatus and must be donned while enroute to the crash and/or fire. Never release both hands from the truck at the same time while donning clothing enroute. The trousers and boots are stored at the side of the bunk when not in use or being dried. Due to the fact that only one complete set of clothing is authorized, the coat, hood, and gloves must be dried at a designated location near the apparatus, where its use necessitates no delay in responding to the crash or fire. Gloves should be kept in coat pockets except when being dried, and then they will be attached to the uppermost snaps of the coat to prevent their loss during donning.

In donning protective clothing on the apparatus, the garments will be put on in the following order: coat, helmet (or hood), and gloves.

Instructor will demonstrate the donning of protective clothing, starting from the bed:

- (1) Place feet into boots, pull trousers up, place suspenders over shoulders, and proceed to the designated spot on the apparatus.
- (2) While holding on with one hand, put either the right or left arm through the coat sleeve and repeat with the other arm; buckle the coat.
- (3) Place helmet and/or hood on the head and secure the chin strap.
- (4) Slip on gloves.

Protective clothing and equipment should be inspected after each use to determine whether torn or worn places are present. In the case of the hood, further inspection is necessary regarding the condition of the transparent face piece.

All garments of protective clothing should be thoroughly washed with water using a brush. Soap should be used only when necessary. Washing should be followed by placing the garments in a prescribed location for drying and/or storage.

The standard breathing equipment authorized for fire fighting personnel is the mask, gas, special, M2A2, all-purpose, M1-III-A1, and is carried on the apparatus. The mask will protect the wearer against a variety of noxious gases when the oxygen content is above 16%. The all-purpose type canister has a usable and safe life of two hours. On the canister is a space provided for registering each period of use. It is most important to record each use immediately to insure safety to the subsequent wearer.

Instructor will demonstrate donning of mask as follows:

- (1) Remove from apparatus and case.
- (2) Adjust body strap.
- (3) Remove helmet.
- (4) Remove face piece from carrier.

- (5) Place face piece on head.
- (6) Adjust head harness.
- (7) Replace helmet on head.

The mask should be thoroughly inspected after each use in order to determine the serviceability of canister, corrugated tube and face piece, including flutter valve, head harness and body straps.

The mask should be kept thoroughly clean, face piece should be washed very carefully with warm water and mild soap, and rinsed and dried thoroughly after cleaning.

The mask should be stored on apparatus in a dry place.

5. PRACTICAL PROCEDURE.

a. Students will draw the following protective clothing from the Department Supply Unit:

- (1) Bunking coat.
- (2) Bunking trousers.
- (3) Boots.
- (4) Suspenders.
- (5) Gloves.
- (6) Helmet.
- (7) Hood.

b. Students will perform inspection of each garment and don clothing and gas mask as prescribed in informational procedure.

6. EVALUATION (Self).

a. Where are the various components of protective clothing and equipment kept when not in use?

b. When should protective clothing and equipment be inspected?

c. Where should gloves be hung during drying?

d. What is the safe life of an all-purpose gas mask canister?

7. CRITIQUE.

The instructor will conduct a critique of this training project and will use the most effective means of summarizing the following key points:

a. Clothing and equipment worn by fire fighting and crash rescuer.

b. Procedures for donning protective clothing and equipment.

c. Procedures for inspecting protective clothing and equipment.

d. Procedures for cleaning and storing of protective clothing and equipment.

e. Procedure for donning and use of the all-purpose gas mask.

f. Inspection and maintenance of the gas mask.

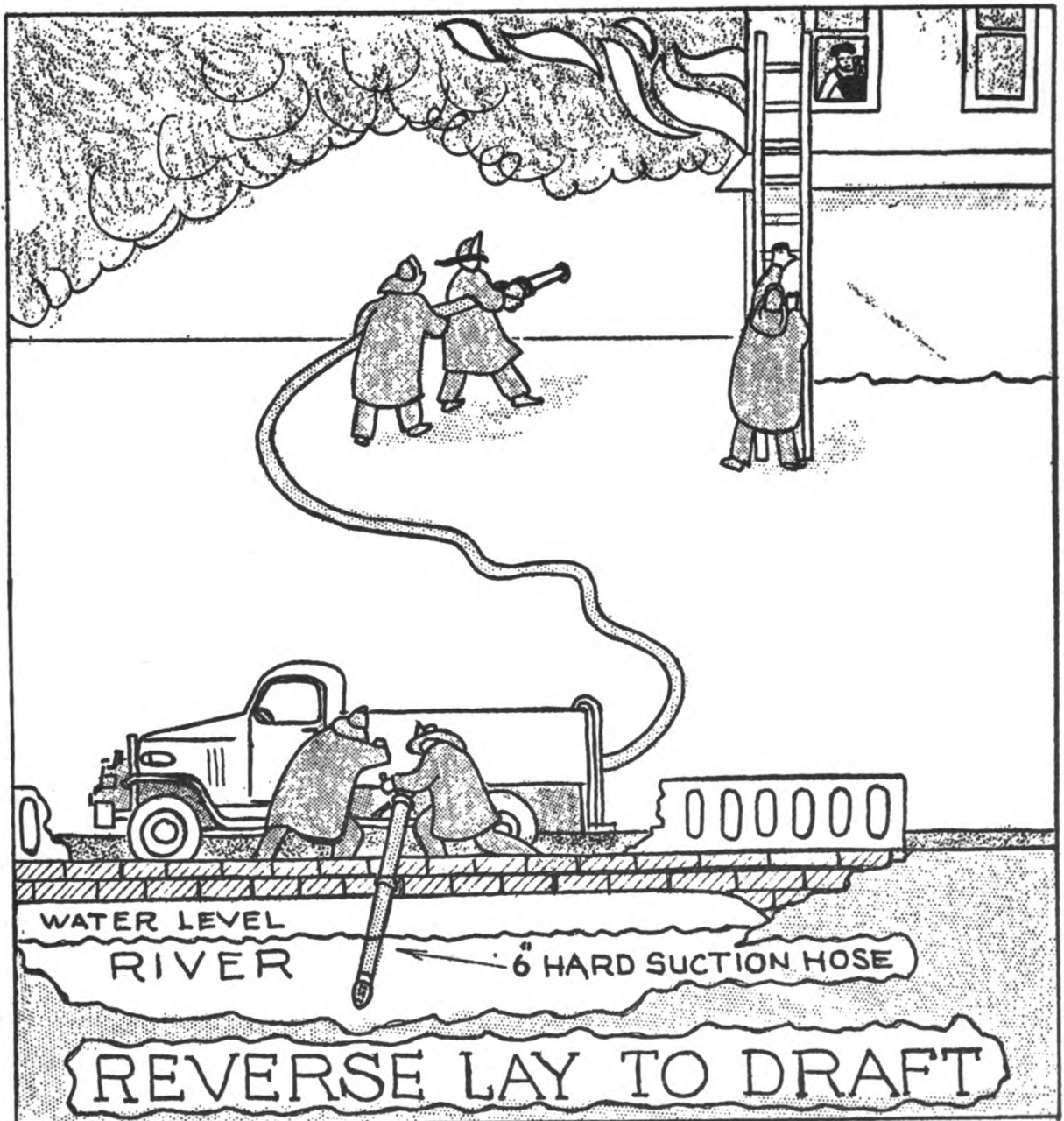
8. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student follow correct procedure for donning clothing?			
2. Did the student know how to inspect protective clothing?			
3. Did the student know the value of proper maintenance and storage of protective clothing?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

CLASS 500 PUMPER TRUCK



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you the identification, operation, (including individual duties of crew members) and inspection and maintenance (including polar) of the Class 500 Pumper Truck.

2. REFERENCE.

TM 5-692, Fire Department Techniques.

TM 5-687, Inspection and Preventive Maintenance Services for Fire Protection Equipment and Appliances.

3. EQUIPMENT.

One Class 500 Pumper Truck fully equipped.

One Hose Loader.

4. INFORMATIONAL PROCEDURE.

For identification, read paragraph b, pages 3 and 4 of TM 5-687.

Evaluate your understanding by answering the following questions:

- (1) What is the pump capacity of the Class 500?
- (2) What type of pump is mounted on the Class 500?
- (3) What is the capacity of the booster tank?
- (4) How many 50-foot sections of 2½-inch hose is carried on the Class 500?
- (5) What is the length of the booster line?
- (6) What is the maximum pump capacity at 200 p.s.i.?

The class 500 Pumper operates similar to the Class 750 Pumper.

Your Instructor will demonstrate:

- (1) Driving.
- (2) Pumping from hydrant.
- (3) Pumping from draft.

Crew positions and duties are the same as outlined for the Class 750 Pumper Truck.

For procedure on replacing ruptured sections or extending hose lines, read paragraph

h, page 47, and see figure 60, page 48, of TM 5-692. For procedure on kinking a charged line, read paragraph f, page 35, Hose Clamp, and see figure 42, page 34, of TM 5-692.

EVALUATION (Self).

- (1) Why should the additional hose be laid into position before applying the hose clamp?
- (2) What procedure may be used when the hose clamp is not available in expediting the replacing or extending of hose lines?
- (3) Where is the hose clamp placed on hose line preparatory to shutting off water?

Your Instructor will demonstrate with your assistance:

- (1) Shutting off water by use of the hose clamp.
- (2) Shutting off water by kinking line.

5. PRACTICAL PROCEDURE.

Your position will be designated and you will be assigned to a crew of 4 by your Instructor on the Class 500 Pumper.

a. You will assist in:

- (1) Loading the hose bed with 1,000 feet of 2½-inch hose by using the hose loader and making the "accordion load" with doughnut roll finish.
- (2) Making a straight hose lay.
- (3) Replacing second section of hose from nozzle, using hose clamp.
- (4) Extending two sections of hose, using hose clamp.
- (5) Kinking hose for replacement of first section or nozzle section.
- (6) Reloading hose on truck.

b. You will assist in:

- (1) Reloading of top layer of hose, using the skid load.
- (2) Making reverse hose lay.
- (3) Drafting water from pit.

- (4) Kinking hose and replacing second section of hose from nozzle.
- (5) Reloading of hose on truck.

c. You will assist in:

- (1) Loading the hose bed with 1,000 feet of 2½-inch hose, using the "hose loader" and making the "horseshoe load" and skid load finish.
- (2) Making a reverse lay.
- (3) Drafting water from pit.
- (4) Handling booster line.
- (5) Reloading hose on truck.

d. You will assist in performing inspection and maintenance of Class 500 Pumper as outlined in Informational Procedure.

EVALUATION (Self).

- (1) What is the capacity of the Class 500 pump at 200 p.s.i?
- (2) What type of pump is mounted on the Class 500 Pumper?
- (3) When replacing a bursted section of hose, where should the hose clamp be applied?
- (4) What are the procedures for kinking a hose line when water is to be shut off?
- (5) What are the procedures to be followed in drafting water with a Class 500 Pumper?
- (6) Why should a thorough inspection be conducted on the truck after each run?

6. CRITIQUE.

Instructor will conduct a critique of this training project outline and summarize the following key points:

a. Operation of pump.

- (1) Similarity to Class 750 Pumper.
- (2) Drafting procedures.

b. Use of hose clamp.

c. Technique of kinking hose to shut off water in hose line.

You will assist in performing maintenance on hose and equipment used in this project.

7. GRADING POINTS.

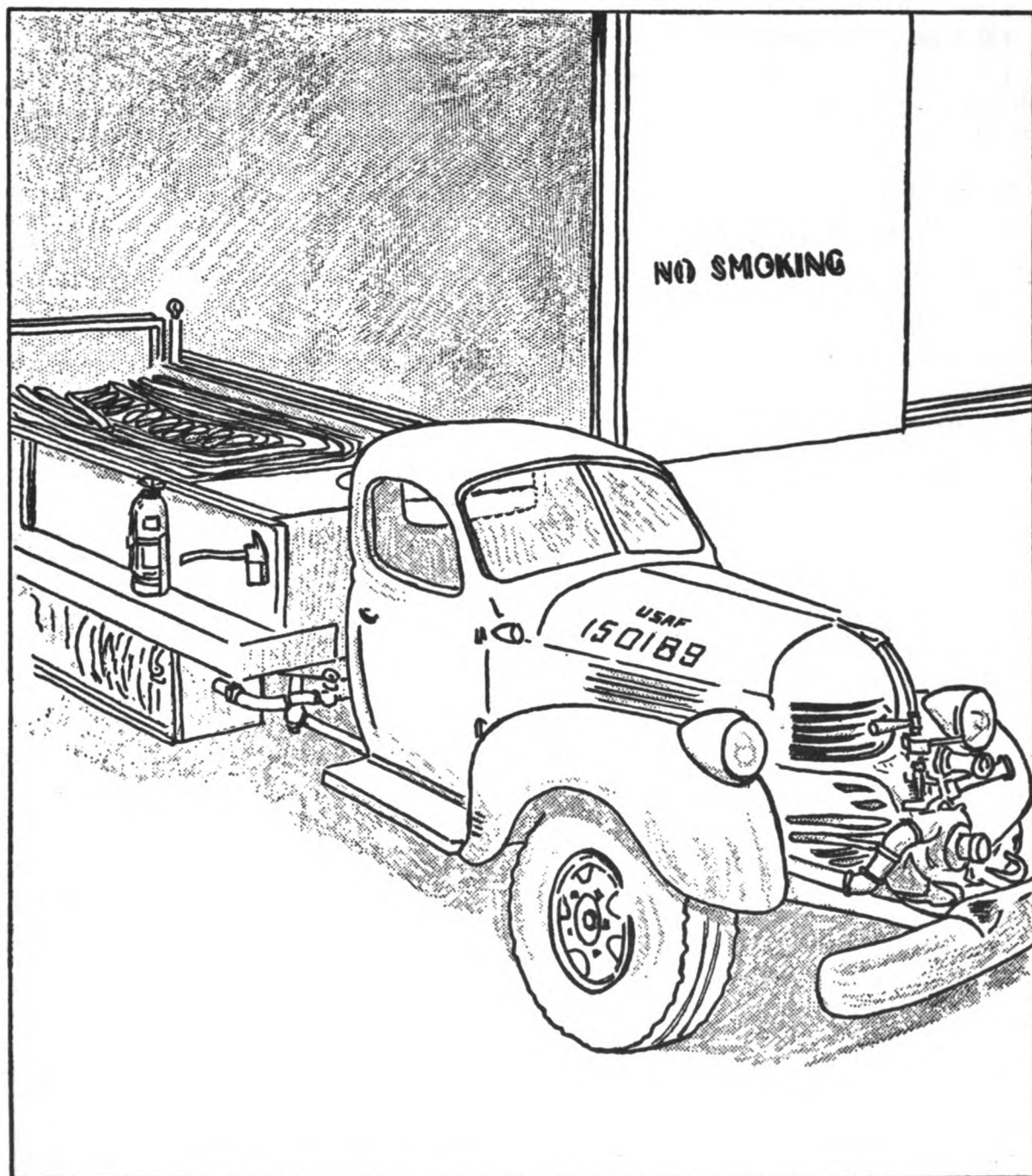
Grading points	Above average + 1	Average 0	Below average - 1
STRAIGHT HOSE LAY			
1. Did student plugman wait until truck stopped to alight from truck with hose and hydrant wrench?			
2. Did student go directly to hydrant, lay hose around hydrant, overlap end of hose, and secure hose with foot?			
3. Did student loosen hydrant cap with wrench and place hydrant wrench on hydrant valve stem?			
4. Did student connect hose to hydrant hand tight on connection toward fire and turn on hydrant.			
5. Did student crew chief alight from truck and advance to point of operation with booster line?			
6. Did student nozzleman wait until truck stopped at point of emergency to alight?			
7. Did student remove sufficient hose for working line, disconnect hose, place end of loose hose line back into hose bed, connect nozzle, and advance with line to point of operation?			
8. Did student pump operator place pump into operation properly for use of booster line?			
9. Did student use correct procedure in shutting off water with hose clamp?			

Grading points	Above average + 1	Average 0	Below average - 1
10. Did student use proper procedure in shutting off water with hose clamp?			
REVERSE HOSE LAY			
11. Did student nozzleman alight from truck and pull sufficient working line and nozzle?			
12. Did plugman stand on side platform while traveling to hydrant?			
13. Did student pump operator position truck at hydrant properly?			
14. Was pump lever placed in proper position before student pump operator alighted from truck?			
15. Was suction hose connected to pump first?			
16. Did student plugman disconnect hose and connect to discharge valve on opposite side from suction hose connection?			
17. Did student plugman observe for and/or tighten leaky couplings while returning to point of operation?			
18. Did student assist in reloading hose after each operation?			
19. Did student assist in performing maintenance to truck after completion of TPO?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

CLASS 325 PUMPER TRUCK



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you identification, operation, (including individual duties of crew members) and inspection and maintenance (including polar) of the Class 325 Pumper Truck.

2. REFERENCE.

TM 5-692, Fire Department Techniques.

TM 5-687, Inspection and Preventive Maintenance Services for Fire Protection Equipment and Appliances.

3. EQUIPMENT.

One Class 325 Pumper Truck fully equipped.

One Class 750 Pumper Truck fully equipped.

One Class 500 Pumper Truck fully equipped.

One Hose Loader.

4. INFORMATIONAL PROCEDURE.

For identification, read paragraph 5, pages 5 and 6, of TM 5-687.

EVALUATION (Self).

- (1) What is the capacity of the Class 325 Pumper Truck?
- (2) What type of pump is mounted on the truck?
- (3) Upon what type of chassis is the Class 325 mounted?
- (4) What is the capacity of the booster tank?
- (5) What is the maximum pump discharge at 200 p.s.i.?
- (6) How many fifty-foot sections of 2½-inch hose are carried on a Class 325 Pumper Truck?
- (7) How many booster lines are carried on this truck?

You will accompany your Instructor to the

Class 325 Pumper for visual identification of tools and appliances.

OPERATION OF THE CLASS 325 PUMP. Engage the pump while the engine motor is idling. (Never attempt to engage the pump while the throttle is advanced and the engine is running at high speed.) The pump is engaged by positioning the shift lever 180 from neutral position. When about a quarter of the total shift lever distance is traveled, the friction clutch engages and accelerates the pump to the speed of the driving mechanism. The last quarter distance of travel permits the positive drive member to engage. When the pump drive joins to the positive drive members, however, it may make contact end to end instead of engaging. When this happens, disengage the clutch lever fully and repeat the movement of putting the pump into gear. Operate the pump shift lever slowly to prevent excessive slipping of the friction clutch when picking up the load, thus preventing clashing of the positive drive member. Do not force the pump lever.

When operating from the hydrant, position the Pumper within easy reach of the hydrant, depending upon the length of the suction hose. Connect the suction hose to the pump, then to the hydrant. The hydrant should be opened fully. Engage the pump gear, open those discharge gate or gates which are intended for use and advance throttle to maintain the desired pressure. Either a soft or hard suction may be used when taking water from a hydrant dependent upon the existing hydrant pressure and current water volume requirements.

When operating from draft, attach the strainer to the male end of the hard suction hose after it is connected to the pump. In all cases when drafting, the hard suction hose must be used. When submerging the hard suction hose with a strainer and rope attached, make sure that the strainer is not resting on the bottom of the water container. Connections on the suction hose and pump must be tight in order to initiate drafting of

water. Air pressure must be sufficiently reduced in the suction hose and pump in order to draft water. This reduction of air pressure is done by the use of a priming mechanism which is a part of the engine.

PRIMING THE PUMP. Close the discharge valve, engage the pump, open the valve between the vacuum primer and pump casing, and increase the engine speed slightly. When the prime has been accomplished, close the valve between the vacuum primer and the pump casing. Increase the engine speed, open the discharge valve slowly and maintain the desired engine pressure as indicated on the compound gauge.

GAUGES. The Class 325 is equipped with two compound gauges which indicate either the positive pressure or vacuum. (Positive pressure is calibrated in pounds per square inch and vacuum pressure in inches). The engine should be run at the lowest speed at which the required pressure can be maintained.

TEMPORARY SHUT-DOWN. When a temporary shut-down is required, it is not necessary to stop the pump. Close the throttle until the pressure is reduced to approximately 20 pounds. Upon resuming operation, open the throttle until the desired working pressure is again established. Never shut the pump down until ordered to do so by the crew chief.

SHUTTING-DOWN OPERATION. When the pumping operation has been completed, shut down the pump by closing the throttle, take the pump out of gear, and close the discharge valve and hydrant. In the case of drafting, raise the suction hose from the water supply and return to the truck and open the bleeder valves on the pump in order to permit drainage. Disconnect the hose from the pump and replace all caps.

PUMPING FROM BOOSTER. When pumping from the booster, determine that all valves and caps on the pump are tight and the valve between the booster tank and pump is open. Open the valve between the

pump and the booster hose. Engage the pump and open the throttle to the desired operating pressure as indicated on the compound gauge. (80-100 p.s.i. is considered adequate for a booster line). When the booster operation is completed, throttle the engine to idling speed and take the pump out of gear. Close the booster tank valve and booster line valve, open the bleeder valves on the pump, and reload the booster hose.

You will evaluate your understanding by answering the following questions:

- (1) In what gear is the road transmission placed when pumping with the Class 325 Pumper?
- (2) Where is the suction hose connected first?
- (3) What type of suction hose is used when drafting?
- (4) What device reduces air pressure in the suction hose and the pump on the Class 325?
- (5) What is the recommended pressure for a temporary shut-down?
- (6) What type of gauge is found on the Class 325 Pumper?
- (7) Why is it necessary to use a strainer when drafting?
- (8) What is the recommended speed for the engine while pumping?

Your Instructor will demonstrate operation of pump:

- (1) When operating from hydrant.
- (2) During priming of the pump and operating from draft.
- (3) During a temporary shutdown.
- (4) When pumping from the booster tank.
- (5) When shutting down the operation.

Crew positions and duties are the same as outlined for the Class 750 Pumper.

"CATCHING AN ENGINE." The same procedure is followed when catching an

engine as previously has been taught for catching a hydrant on a straight lay, except instead of catching the hydrant, the end of the hose will be slid carefully under the wheel (rear or front) and the foot forced against the outside edge of the tire and hose.

Your instructor will demonstrate patching the engine.

Where the engine is working at the hydrant and a reverse hose lay is to be made by another Pumper, the same procedures are followed except working engine's discharge valve connection will be utilized instead of connecting engine to hydrant. A spare pumper will immediately return to point of operation for further orders.

When it is necessary to lay exceedingly long hose lines, engines are placed in tandem. In this manner, one engine utilizes water forced to it from the one next in line to the source of the water supply. The operation is similar to pumping from hydrant in that a minimum of five pounds must be maintained on the intake side of the pump indicated by the compound gauge in order to supply effective fire streams.

When fire trucks arrive at the scene of a fire it is determined by the senior fire officer that the magnitude of the fire is beyond the capabilities of the booster line operations and that the water supply is sufficiently removed from the fire location to warrant a relay operation, the following procedures will be used where three Pumpers are utilized.

- (1) The first truck to arrive will make a reverse lay, proceed in the safest and most direct route toward the water supply until all hose has been laid, and stop. The hose will be connected to the discharge gate toward the fire in the same manner as a normal reverse lay. The pump operator will remove the suction cap on the opposite side from the hose line and connect the $4\frac{1}{2} \times 2\frac{1}{2}$ -inch double female to the suction side of the pump. When the second truck arrives, the pump operator will assist in connecting the hose line to the intake of the pump. See figure 1.

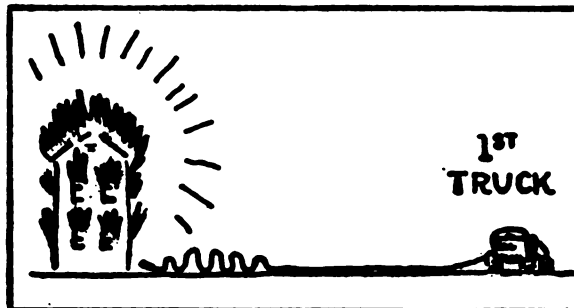


Figure 1.

- (2) The second truck will make a reverse hose lay. The nozzleman will catch the wheel of the first truck, and connect the line to the intake of the pump. The truck will proceed in the direction of the water supply

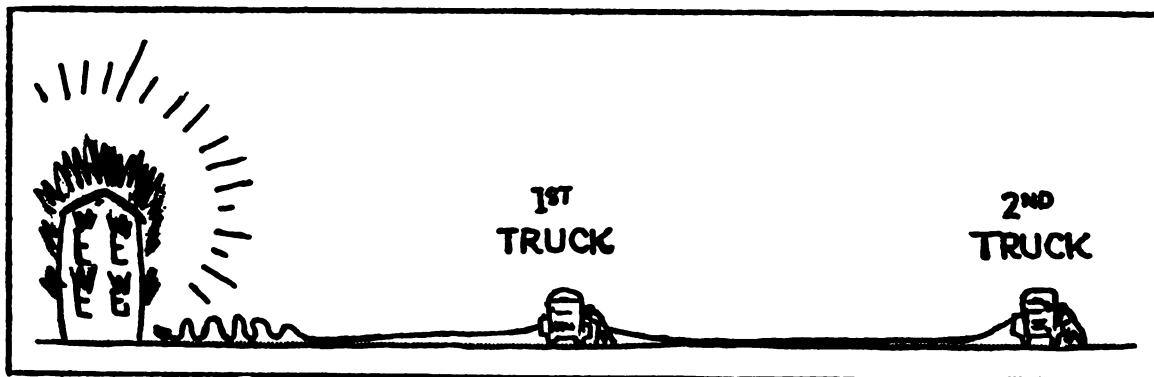


Figure 2.

until all hose has been laid. The second truck stops and performs the same procedures as outlined for the first truck. See figure 2.

- (3) The third truck to arrive will make a reverse hose lay, following the same procedures as outlined for the second truck. The pump operator will connect to the hydrant as prescribed for a normal reverse lay. See Figure 3.

- (4) What is the minimum pressure to be maintained on the intake side of the pump as indicated on the compound gauge?
- (5) What is the purpose of the relay operation?
- (6) Why is a relay operation similar to pumping from hydrant?
- (7) What means of communication can be used when Pumpers are working in relay operations?

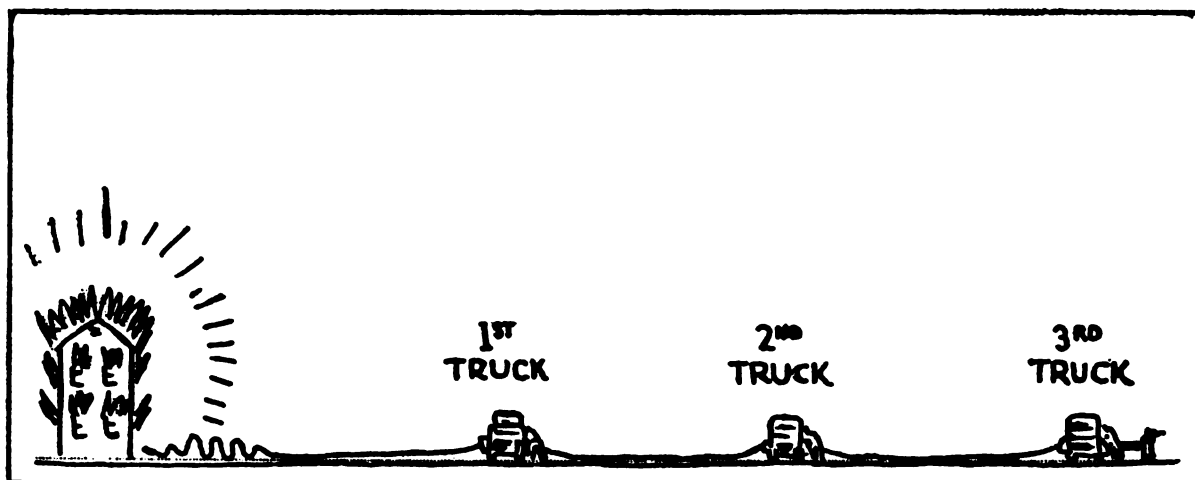


Figure 3.

Contact will be maintained between engines by the use of hand signals. Fifty pounds of nozzle pressure will be maintained. Procedures of pumping for the engine closest to the nozzle will be the same as for the reverse lay. Other engines will act as water supply units, maintaining an intake pressure of five pounds. The shut-down and reloading of the hose and equipment is the same as for the reverse hose lay.

EVALUATION (Self).

- (1) What is the procedure for "catching an engine?"
- (2) What procedure is followed when reverse lay is made to another pumper working at the hydrant?
- (3) What is the procedure for relay operation using three Pumpers?

Your Instructor, with your assistance, will demonstrate the relay operation using three Pumpers.

5. PRACTICAL PROCEDURE.

Your position will be designated, and you will be assigned to a crew of 4 by your Instructor on the Class 325 Pumper.

a. You will assist in:

- (1) Loading the hose bed with 500 feet of 2½ inch hose by using hose loader and making the "horseshoe load" with the skid load finish.
- (2) Making a straight hose lay using both booster lines.
- (3) Reloading hose on the truck.

b. You will assist in:

- (1) Reloading of the top layer of hose using the "doughnut load."

- (2) Making a reverse lay to the drafting pit and drafting water.

c. You will assist in:

- (1) The relay operation using the Class 325, 500, and 750 Pumpers.

Your position will be designated, and you will be assigned to a crew of 4 on a designated Pumper by your Instructor.

a. You will assist in:

- (1) Loading the Class 750 Pumper with 500 feet of 2½-inch hose, making the "accordion load" with a doughnut roll finish.
- (2) Loading the Class 500 Pumper with 500 feet of 2½-inch hose, and making the "horseshoe load" with a skid load finish.
- (3) Loading a Class 325 Pumper with 300 feet of 2½-inch hose and making the "accordion load."

The Class 750 Pumper will be the first truck to initiate a relay operation.

The Class 325 Pumper will be the second in tandem.

The Class 500 Pumper will be the third truck in operation.

b. You will assist in:

- (1) Reloading hose after which the apparatus will be driven to an area designated by your Instructor.
- (2) Performing "After-Each-Run" inspection and Maintenance of a Pumper designated by your Instructor.

EVALUATION (Self).

- (1) What type of pump is mounted on the Class 325 Pumper?
- (2) What is the capacity of the booster tank?
- (3) Where is the suction hose connected first?

- (4) What method is used in reducing air pressure in the suction hose and the pump on the Class 325 pumper?

- (5) What is the recommended pressure for a temporary shut-down?

- (6) What is the procedure for catching an engine?

- (7) What is the minimum pressure to be maintained on the intake side of the pump as indicated on the compound gauge?

- (8) Why is the relay operation necessary?

- (9) Why is a relay operation similar to pumping from a hydrant?

6. CRITIQUE.

The Instructor will conduct a critique of this training project outline and summarize the following key points:

a. The operation of the Class 325 Pump from hydrant and draft.

b. The importance of loading hose so that the couplings will not have to turn when the hose is playing out of the hose bed.

c. Loading the hose so that no two couplings will be together.

d. The procedure for "catching" another Pumper.

e. The procedure for laying hose line to another pumper positioned at the hydrant.

f. The purpose and procedure for the relay operation.

g. Importance of "After-Each-Run Inspection and Maintenance procedures.

You will assist in performing maintenance of the hose and equipment used in this project.

7. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
DID STUDENT			
1. Properly place pump in operation when pumping from hydrant?			
2. Observe gauges while operating?			
3. Properly operate pump when pumping from booster?			
4. Properly place pump in operation when drafting?			
5. Secure the suction hose and locate strainer the proper distance from bottom of drafting pit?			
6. While catching the engine, properly secure hose against edge of the tire?			
7. Properly perform "After-Each-Run" Inspection and Maintenance?			
8. Perform his individual duties on the straight and reverse hose lays?			
9. Perform his individual duties on the relay operation?			
10. Perform his assignment in the maintenance of equipment?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

INTERIOR FIRES



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

- a. The methods of receiving and responding to fire alarms, including the size-up.
- b. The methods of ventilating, forcible entry, rescuing personnel, and administering first aid.
- c. The procedures for confining and extinguishing interior fires, including salvage operations.
- d. The procedures for the overhaul and the preservation of evidence.

2. REFERENCE.

- a. TM 21-11, First Aid for Soldiers.
- b. TM 5-692, Fire Department Techniques.
- c. TM 5-696, Automatic and Manual Fire Alarm Systems, Inspection Tests and Maintenance.

3. EQUIPMENT.

- a. One Class 750 Pumper fully equipped.
- b. One Class 500 Pumper fully equipped.
- c. One training building.
- d. One gas mask, diaphragm type, model M3A1, All-purpose, IVAL.

4. INFORMATIONAL PROCEDURE.

Interior fires are those fires which originate inside the building and have not communicated to the outside. Interior fires present a variety of variable and complex conditions due to the intense heat and concentration of obnoxious and toxic gases resulting from combustion or incomplete combustion.

Read section 4, paragraphs 13, 14, and 15, pages 37 through 39 of TM 5-696.

When receiving the fire alarm, the person must be positive that he receives the correct information. Upon hearing the "alarm", the crew will quickly assume their respective positions on the apparatus and commence donning of their protective clothing. The truck will not be started until the crew chief has received the necessary information regarding the location of the fire. This will

prevent any misunderstanding of the fire alarm. The pump operator will then start the truck and respond to the fire as directed by the crew chief. In the event that the emergency is not in your particular company's area, you will stand by in readiness until notified by the fire alarm operator.

SIZE UP. Read paragraph 33, pages 63 and 64, of TM 5-692.

EVALUATION (Self).

- (1) What is the procedure for the crew when the alarm is sounded?
- (2) Why is the truck not started as soon as the alarm is sounded?
- (3) What four conditions should the crew chief consider when making a size-up?

Your Instructor, with your assistance, will demonstrate the receiving and the responding to a fire alarm, and making a size-up.

(NOTE: The Instructor will cause a fire to be started in the training building).

- (1) Answer alarm (using fire Phone).
- (2) Dispatch information to the crew chief.
- (3) Start the truck and respond to the fire.
- (4) Make size-up of burning building.

VENTILATION. Read paragraph 35, page 65, of TM 5-692.

EVALUATION (Self).

- (1) What safety precautions should be considered when ventilating?
- (2) Why should ventilation be performed on the leeward side first?
- (3) Why should charged lines be laid at the point of entry before the opening is made?
- (4) Why should ventilation be made above the seat of the fire?
- (5) Why should roof openings be extended down through the room ceiling?

FORCIBLE ENTRY. Read section 4, of TM 5-692.

EVALUATION (Self).

- (1) When is forcible entry necessary?
- (2) Name four standard forcible entry tools used in structural fire fighting?
- (3) Why should floors and sheeting be cut at an angle?
- (4) Where should the wedge of the door opener be inserted when prying a panel door open?
- (5) Why should you stand to one side when making forcible entry through a door or window?
- (6) What are the four precautions to be taken when removing board ceiling with a pike pole?

Your instructor will demonstrate the use of forcible entry tools:

- (1) Pike pole.
- (2) Door opener.
- (3) Pickhead axe.
- (4) Crow bar.

RESCUE OF PERSONNEL AND THE ADMINISTERING OF FIRST AID. Read pages 60 and 61, Fireman's Carry, of FM 21-11. Read page 52 and see diagram on page 53, Artificial Respiration, of FM 21-11.

EVALUATION (Self).

- (1) What is the advantage of the fireman's carry.
- (2) How many steps are necessary in getting a man into position for using the fireman's carry?
- (3) When is it necessary to perform artificial respiration?
- (4) How long should artificial respiration be continued?
- (5) What cadence should be used when applying artificial respiration?

Your instructor will demonstrate rescue of dummy personnel, using the fireman's drag and carry, and the administering of artificial respiration.

CONFINE AND EXTINGUISH INTERIOR FIRES INCLUDING SALVAGE OPERATIONS. Read paragraph 36, page 66, Fire Extinguishment, and paragraphs 26, 27, and 28, pages 53 through 57, Salvage, of TM 5-692.

EVALUATION (Self).

- (1) How is the base of the fire located?
- (2) What is the advantage of using a water vapor curtain when locating the base of the fire?
- (3) What safety precautions should be taken during extinguishment?
- (4) What is the purpose of salvage work in fire fighting?

Your Instructor will demonstrate, with your assistance, the following operations.

- (1) Confining the fire.
- (2) Using salvage covers.
- (3) Extinguishing the fire.

OVERHAUL AND PRESERVATION OF EVIDENCE. When the fire has been extinguished, an overhaul should be made of the building and the area to determine whether all the fire has been extinguished. Do not molest the contents any more than is necessary. When articles are removed from the building during the fire fighting operation, notify the fire officer in charge. The less the contents are disturbed, the better chance the investigating party will have in determining the cause of the fire.

EVALUATION (Self).

- (1) What is meant by overhaul?
- (2) What is the purpose of preserving evidence?
- (3) What procedure is followed when contents of building are removed during the fire fighting operation?

5. PRACTICAL PROCEDURE.

Your Instructor will assign you to a crew. When and where the position will be designated. Class of 500 Pumpers.

You will assist in filling the booster tanks on the Class 750 and 500 Pumpers.

You will assist in loading the Class 750 and 500 Pumpers with 1,000 feet of 2½-inch hose, using the "horseshoe load" with the skid load finish.

Your instructor will designate the simulated fire station and the area to be used for this operation.

You will rotate to each position until you have performed the duties of:

- (1) Crew chief.
- (2) Pump operator.
- (3) Plugman.
- (4) Nozzleman.

The Class 750 Pumper will respond first and make a reverse lay.

The Class 500 Pumper will respond second and make a reverse hose lay to the Class 750 Pumper, (The 750 Pumper will be positioned at the hydrant) and return to the fire and utilize the booster line.

You will assist in:

- (1) Receiving and responding to the fire alarm.
- (2) Performing the size-up of the fire.
- (3) Ventilating the burning building.
- (4) Performing forcible entry into the burning building.
- (5) Rescuing personnel from the burning building and administering first aid. (*Note: Gas mask will be donned before entering burning building.*)
- (6) Confining and extinguishing the fire.
- (7) Performing salvage operations.
- (8) Overhauling and preserving of evidence.
- (9) Reloading hose and equipment on the pumpers.

EVALUATION (Self).

- (1) What is the procedure for the crew when fire alarm is sounded?
- (2) What is the purpose of the size-up?
- (3) What is the purpose of having charged line present prior to ventilating a burning building?
- (4) Why is ventilation necessary before entering a burning building?
- (5) What is the purpose of the salvage operations?
- (6) What is the purpose of the overhaul?
- (7) Why is the preservation of evidence necessary?

6. CRITIQUE.

The Instructor will conduct a critique of this training project outline and summarize the following points:

- (1) Receiving alarm and responding to the fire.
- (2) Methods of sizing up the burning building.
- (3) Procedures for ventilating the burning building.
- (4) Methods and tools used in forcible entry.
- (5) Procedures for rescue of personnel and administering of first aid.
- (6) Importance and use of the gas mask in firefighting.
- (7) Methods of confining the extinguishing the fire.
- (8) Procedures for salvage, overhaul, and preservation of evidence.

You will assist in performing maintenance on the equipment and the hose used in this project.

7. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student take his proper position at the sounding of the alarm?			
2. Did the student make the correct size-up while approaching the fire?			
3. Did the student remove the necessary equipment at the scene of the emergency?			
4. Did the student use the correct procedure when ventilating?			
5. Did the student try to open the doors and the windows before making the forcible entry?			
6. Did the student remove the dummy personnel and administer first aid by the correct procedures?			
7. Did the student perform the salvage and the overhaul procedures properly?			
8. Did the student perform the procedures for the preserving of evidence properly?			
9. Did the student perform the proper maintenance on the equipment?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

EXTERIOR FIRES



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

- a. The procedures for making the size-up of a fire.
- b. The methods of covering exposures.
- c. To confine, control, and extinguish exterior fires.
- d. The proper procedures of salvage, overhaul, and the preservation of evidence.

2. REFERENCE.

TM 5-692, Fire Department Techniques.

3. EQUIPMENT.

- a. One Class 750 Pumper fully equipped.
- b. One Class 500 Pumper fully equipped.
- c. One Class 325 Pumper fully equipped.
- d. One training building.
- e. One hose loader.

4. INFORMATION PROCEDURE.

Read the following information:

Exterior fires are interpreted to mean those fires which have originated from the exposure of heat from another burning building or an outside fire. Exterior fires are also originated from interior fires which have communicated to the outside through windows, doors, ventilators, roofs, or any portions of the building, and commences to envelop the building with flame. Due to the intensity and magnitude of the exterior fire, large quantities of water should be used quickly to bring the fire under control. Sound judgment must be exercised when fighting exterior fires to prevent an "exposure fire." In some exterior fires, it is far better to protect exposure risks with the hose stream than to continuously attack the burning building.

The size-up of a fire means the making of a quick survey of the situation as encountered by the fire department upon arrival. Correct sizeup is of tremendous importance. Upon this, the size-up, the initial plan is based. The heaviest responsibility rests upon the first fire officer to arrive at the scene of an emergency.

The first steps of the size-up are the loca-

tion and general conditions of the fire. The next point is the occupancy of the building. The third step in the size-up is the exposure risk. The types of exposures encountered involve both life and property.

Personnel on the leeward side of the fire may be exposed to dangerous fumes and gases thrown off by the fire.

Properties directly across the street or adjacent to the fire building are fire exposures. The direction of the wind will determine in which direction the greater exposures are located. In covering exposures, first attention will be given to the more seriously exposed hazards.

Means of confining the fire to the building in which it is burning or protecting exposures is accomplished by use of water streams. The size of the water streams are of great importance. Read paragraph 29, sections a and b, page 59, of TM 5-692, and section X paragraph 34, sub paragraph b, page 64, of TM 5-692.

When responding to an exterior fire, the first fire company to arrive will lay a hose line to cover the most hazardous exposure, which is normally on the leeward side of the fire.

The second line will be utilized to cover the exposures on the windward side of the fire.

The third line will be utilized to attack the fire.

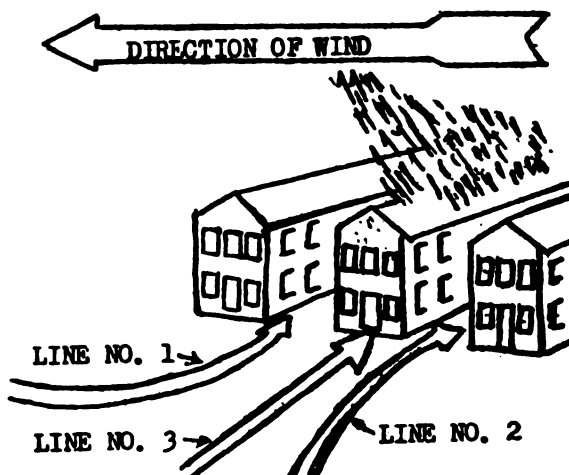


Figure 1.

EVALUATION (Self).

- (1) What is meant by size-up?
- (2) Upon what is the success of the operation based?
- (3) Why is a correct size-up of tremendous importance?
- (4) Who assumes the greatest responsibility at the scene of the emergency?
- (5) What is the first step in making a size-up?
- (6) How many types of exposures are encountered?
- (7) What consideration should be given to the wind direction?
- (8) How is the fire confined to the building in which it is burning?
- (9) Where should the water be applied on the fire to be most effective?
- (10) Why is the first line laid to cover the exposure on an exterior fire?
- (11) Where are the most hazardous exposures located at an exterior fire?
- (12) What line is generally used to initiate extinguishment of exterior fire?

Your Instructor will demonstrate size-up and covering exposures as heretofore outlined.

SALVAGE OPERATION. The procedure for performing salvage operations on exterior fires are similar to those of interior fires.

OVERHAUL AND PRESERVATION OF EVIDENCE. After extinguishment, an overall inspection must be made to determine whether all of the fire has been extinguished. Do not molest the contents anymore than is necessary, and never remove any articles from the building until approval is given by the fire office in charge. The less contents are moved, the better chance the investigating party has to determine the cause of the fire.

EVALUATION (Self).

- (1) What is the purpose of salvage covers?

- (2) What is meant by overhaul and investigation?
- (3) What is the purpose of the preservation of evidence?
- (4) When will the fire fighter remove contents from the building?

Your Instructor will demonstrate salvage, overhaul, and preservation of evidence in exterior fires.

5. PRACTICAL PROCEDURE.

Your position will be designated, and you will be assigned to a crew of four by your Instructor on a designated pumper.

You will assist in filling the booster tank on the truck.

You will assist in performing the daily inspection on an assigned Pumper.

You will assist in loading the Class 750 Pumper with 1,000 feet of 2½-inch hose by using the "horseshoe load" with the skid load finish.

The Class 750 Pumper will be the first truck to arrive. You will assist in making a reverse hose lay, and will respond upon a signal from your Instructor.

You will assist in covering the lee-side exposure as outlined in Informational Procedure.

You will assist in loading the Class 325 Pumper with 600 feet of 2½-inch hose by using the "accordion load" with a doughnut roll finish.

The Class 325 Pumper will be the second truck to arrive. You will assist in catching the Class 750 Pumper and making a straight hose lay by using the booster line, and will respond upon a signal from your Instructor.

You will assist in covering the windward side exposure as outlined in Informational Procedure.

You will assist in loading the Class 500 Pumper with 1,000 feet of 2½-inch hose by using the "horseshoe load" with a skid load finish.

The Class 500 Pumper will be the third truck to arrive. You will assist in catching

**HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO**

**DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH**

INTERIOR FIRES



FOR TRAINING PURPOSES ONLY

**HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO**

**DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH**

INTERIOR FIRES



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you :

- a. The methods of receiving and responding to fire alarms, including the size-up.
- b. The methods of ventilating, forcible entry, rescuing personnel, and administering first aid.
- c. The procedures for confining and extinguishing interior fires, including salvage operations.
- d. The procedures for the overhaul and the preservation of evidence.

2. REFERENCE.

- a. TM 21-11, First Aid for Soldiers.
- b. TM 5-692, Fire Department Techniques.
- c. TM 5-696, Automatic and Manual Fire Alarm Systems, Inspection Tests and Maintenance.

3. EQUIPMENT.

- a. One Class 750 Pumper fully equipped.
- b. One Class 500 Pumper fully equipped.
- c. One training building.
- d. One gas mask, diaphragm type, model M3A1, All-purpose, IVAL.

4. INFORMATIONAL PROCEDURE.

Interior fires are those fires which originate inside the building and have not communicated to the outside. Interior fires present a variety of variable and complex conditions due to the intense heat and concentration of obnoxious and toxic gases resulting from combustion or incomplete combustion.

Read section 4, paragraphs 13, 14, and 15, pages 37 through 39 of TM 5-696.

When receiving the fire alarm, the person must be positive that he receives the correct information. Upon hearing the "alarm", the crew will quickly assume their respective positions on the apparatus and commence donning of their protective clothing. The truck will not be started until the crew chief has received the necessary information regarding the location of the fire. This will

prevent any misunderstanding of the fire alarm. The pump operator will then start the truck and respond to the fire as directed by the crew chief. In the event that the emergency is not in your particular company's area, you will stand by in readiness until notified by the fire alarm operator.

SIZE UP. Read paragraph 33, pages 63 and 64, of TM 5-692.

EVALUATION (Self).

- (1) What is the procedure for the crew when the alarm is sounded?
- (2) Why is the truck not started as soon as the alarm is sounded?
- (3) What four conditions should the crew chief consider when making a size-up?

Your Instructor, with your assistance, will demonstrate the receiving and the responding to a fire alarm, and making a size-up.

(NOTE: The Instructor will cause a fire to be started in the training building).

- (1) Answer alarm (using fire Phone).
- (2) Dispatch information to the crew chief.
- (3) Start the truck and respond to the fire.
- (4) Make size-up of burning building.

VENTILATION. Read paragraph 35, page 65, of TM 5-692.

EVALUATION (Self).

- (1) What safety precautions should be considered when ventilating?
- (2) Why should ventilation be performed on the leeward side first?
- (3) Why should charged lines be laid at the point of entry before the opening is made?
- (4) Why should ventilation be made above the seat of the fire?
- (5) Why should roof openings be extended down through the room ceiling?

FORCIBLE ENTRY. Read section 4, of TM 5-692.

EVALUATION (Self).

- (1) When is forcible entry necessary?
- (2) Name four standard forcible entry tools used in structural fire fighting?
- (3) Why should floors and sheeting be cut at an angle?
- (4) Where should the wedge of the door opener be inserted when prying a panel door open?
- (5) Why should you stand to one side when making forcible entry through a door or window?
- (6) What are the four precautions to be taken when removing board ceiling with a pike pole?

Your instructor will demonstrate the use of forcible entry tools:

- (1) Pike pole.
- (2) Door opener.
- (3) Pickhead axe.
- (4) Crow bar.

RESCUE OF PERSONNEL AND THE ADMINISTERING OF FIRST AID. Read pages 60 and 61, Fireman's Carry, of FM 21-11. Read page 52 and see diagram on page 53, Artificial Respiration, of FM 21-11.

EVALUATION (Self).

- (1) What is the advantage of the fireman's carry.
- (2) How many steps are necessary in getting a man into position for using the fireman's carry?
- (3) When is it necessary to perform artificial respiration?
- (4) How long should artificial respiration be continued?
- (5) What cadence should be used when applying artificial respiration?

Your instructor will demonstrate rescue of dummy personnel, using the fireman's drag and carry, and the administering of artificial respiration.

CONFINE AND EXTINGUISH INTERIOR FIRES INCLUDING SALVAGE OPERATIONS. Read paragraph 36, page 66, Fire Extinguishment, and paragraphs 26, 27, and 28, pages 53 through 57, Salvage, of TM 5-692.

EVALUATION (Self).

- (1) How is the base of the fire located?
- (2) What is the advantage of using a water vapor curtain when locating the base of the fire?
- (3) What safety precautions should be taken during extinguishment?
- (4) What is the purpose of salvage work in fire fighting?

Your Instructor will demonstrate, with your assistance, the following operations.

- (1) Confining the fire.
- (2) Using salvage covers.
- (3) Extinguishing the fire.

OVERHAUL AND PRESERVATION OF EVIDENCE. When the fire has been extinguished, an overhaul should be made of the building and the area to determine whether all the fire has been extinguished. Do not molest the contents any more than is necessary. When articles are removed from the building during the fire fighting operation, notify the fire officer in charge. The less the contents are disturbed, the better chance the investigating party will have in determining the cause of the fire.

EVALUATION (Self).

- (1) What is meant by overhaul?
- (2) What is the purpose of preserving evidence?
- (3) What procedure is followed when contents of building are removed during the fire fighting operation?

5. PRACTICAL PROCEDURE.

Your Instructor will assign you to a crew of 4 men and your position will be designated on the Class 750 and 500 Pumpers.

You will assist in filling the booster tanks on the Class 750 and 500 Pumpers.

You will assist in loading the Class 750 and 500 Pumpers with 1,000 feet of 2½-inch hose, using the "horseshoe load" with the skid load finish.

Your instructor will designate the simulated fire station and the area to be used for this operation.

You will rotate to each position until you have performed the duties of:

- (1) Crew chief.
- (2) Pump operator.
- (3) Plugman.
- (4) Nozzleman.

The Class 750 Pumper will respond first and make a reverse lay.

The Class 500 Pumper will respond second and make a reverse hose lay to the Class 750 Pumper, (The 750 Pumper will be positioned at the hydrant) and return to the fire and utilize the booster line.

You will assist in:

- (1) Receiving and responding to the fire alarm.
- (2) Performing the size-up of the fire.
- (3) Ventilating the burning building.
- (4) Performing forcible entry into the burning building.
- (5) Rescuing personnel from the burning building and administering first aid. (Note: Gas mask will be donned before entering burning building.)
- (6) Confining and extinguishing the fire.
- (7) Performing salvage operations.
- (8) Overhauling and preserving of evidence.
- (9) Reloading hose and equipment on the pumpers.

EVALUATION (Self).

- (1) What is the procedure for the crew when fire alarm is sounded?
- (2) What is the purpose of the size-up?
- (3) What is the purpose of having charged line present prior to ventilating a burning building?
- (4) Why is ventilation necessary before entering a burning building?
- (5) What is the purpose of the salvage operations?
- (6) What is the purpose of the overhaul?
- (7) Why is the preservation of evidence necessary?

6. CRITIQUE.

The Instructor will conduct a critique of this training project outline and summarize the following points:

- (1) Receiving alarm and responding to the fire.
- (2) Methods of sizing up the burning building.
- (3) Procedures for ventilating the burning building.
- (4) Methods and tools used in forcible entry.
- (5) Procedures for rescue of personnel and administering of first aid.
- (6) Importance and use of the gas mask in firefighting.
- (7) Methods of confining the extinguishing the fire.
- (8) Procedures for salvage, overhaul, and preservation of evidence.

You will assist in performing maintenance on the equipment and the hose used in this project.

FORCIBLE ENTRY. Read section 4, of TM 5-692.

EVALUATION (Self).

- (1) When is forcible entry necessary?
- (2) Name four standard forcible entry tools used in structural fire fighting?
- (3) Why should floors and sheeting be cut at an angle?
- (4) Where should the wedge of the door opener be inserted when prying a panel door open?
- (5) Why should you stand to one side when making forcible entry through a door or window?
- (6) What are the four precautions to be taken when removing board ceiling with a pike pole?

Your instructor will demonstrate the use of forcible entry tools:

- (1) Pike pole.
- (2) Door opener.
- (3) Pickhead axe.
- (4) Crow bar.

RESCUE OF PERSONNEL AND THE ADMINISTERING OF FIRST AID. Read pages 60 and 61, Fireman's Carry, of FM 21-11. Read page 52 and see diagram on page 53, Artificial Respiration, of FM 21-11.

EVALUATION (Self).

- (1) What is the advantage of the fireman's carry.
- (2) How many steps are necessary in getting a man into position for using the fireman's carry?
- (3) When is it necessary to perform artificial respiration?
- (4) How long should artificial respiration be continued?
- (5) What cadence should be used when applying artificial respiration?

Your instructor will demonstrate rescue of dummy personnel, using the fireman's drag and carry, and the administering of artificial respiration.

CONFINE AND EXTINGUISH INTERIOR FIRES INCLUDING SALVAGE OPERATIONS. Read paragraph 36, page 66, Fire Extinguishment, and paragraphs 26, 27, and 28, pages 53 through 57, Salvage, of TM 5-692.

EVALUATION (Self).

- (1) How is the base of the fire located?
- (2) What is the advantage of using a water vapor curtain when locating the base of the fire?
- (3) What safety precautions should be taken during extinguishment?
- (4) What is the purpose of salvage work in fire fighting?

Your Instructor will demonstrate, with your assistance, the following operations.

- (1) Confining the fire.
- (2) Using salvage covers.
- (3) Extinguishing the fire.

OVERHAUL AND PRESERVATION OF EVIDENCE. When the fire has been extinguished, an overhaul should be made of the building and the area to determine whether all the fire has been extinguished. Do not molest the contents any more than is necessary. When articles are removed from the building during the fire fighting operation, notify the fire officer in charge. The less the contents are disturbed, the better chance the investigating party will have in determining the cause of the fire.

EVALUATION (Self).

- (1) What is meant by overhaul?
- (2) What is the purpose of preserving evidence?
- (3) What procedure is followed when contents of building are removed during the fire fighting operation?

5. PRACTICAL PROCEDURE.

Your Instructor will assign you to a crew of 4 men and your position will be designated on the Class 750 and 500 Pumpers.

You will assist in filling the booster tanks on the Class 750 and 500 Pumpers.

You will assist in loading the Class 750 and 500 Pumpers with 1,000 feet of 2½-inch hose, using the "horseshoe load" with the skid load finish.

Your instructor will designate the simulated fire station and the area to be used for this operation.

You will rotate to each position until you have performed the duties of:

- (1) Crew chief.
- (2) Pump operator.
- (3) Plugman.
- (4) Nozzleman.

The Class 750 Pumper will respond first and make a reverse lay.

The Class 500 Pumper will respond second and make a reverse hose lay to the Class 750 Pumper, (The 750 Pumper will be positioned at the hydrant) and return to the fire and utilize the booster line.

You will assist in:

- (1) Receiving and responding to the fire alarm.
- (2) Performing the size-up of the fire.
- (3) Ventilating the burning building.
- (4) Performing forcible entry into the burning building.
- (5) Rescuing personnel from the burning building and administering first aid. (Note: Gas mask will be donned before entering burning building.)
- (6) Confining and extinguishing the fire.
- (7) Performing salvage operations.
- (8) Overhauling and preserving of evidence.
- (9) Reloading hose and equipment on the pumpers.

EVALUATION (Self).

- (1) What is the procedure for the crew when fire alarm is sounded?
- (2) What is the purpose of the size-up?
- (3) What is the purpose of having charged line present prior to ventilating a burning building?
- (4) Why is ventilation necessary before entering a burning building?
- (5) What is the purpose of the salvage operations?
- (6) What is the purpose of the overhaul?
- (7) Why is the preservation of evidence necessary?

6. CRITIQUE.

The Instructor will conduct a critique of this training project outline and summarize the following points:

- (1) Receiving alarm and responding to the fire.
- (2) Methods of sizing up the burning building.
- (3) Procedures for ventilating the burning building.
- (4) Methods and tools used in forcible entry.
- (5) Procedures for rescue of personnel and administering of first aid.
- (6) Importance and use of the gas mask in firefighting.
- (7) Methods of confining the extinguishing the fire.
- (8) Procedures for salvage, overhaul, and preservation of evidence.

You will assist in performing maintenance on the equipment and the hose used in this project.

7. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student take his proper position at the sounding of the alarm?			
2. Did the student make the correct size-up while approaching the fire?			
3. Did the student remove the necessary equipment at the scene of the emergency?			
4. Did the student use the correct procedure when ventilating?			
5. Did the student try to open the doors and the windows before making the forcible entry?			
6. Did the student remove the dummy personnel and administer first aid by the correct procedures?			
7. Did the student perform the salvage and the overhaul procedures properly?			
8. Did the student perform the procedures for the preserving of evidence properly?			
9. Did the student perform the proper maintenance on the equipment?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

EXTERIOR FIRES



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

- a. The procedures for making the size-up of a fire.
- b. The methods of covering exposures.
- c. To confine, control, and extinguish exterior fires.
- d. The proper procedures of salvage, overhaul, and the preservation of evidence.

2. REFERENCE.

TM 5-692, Fire Department Techniques.

3. EQUIPMENT.

- a. One Class 750 Pumper fully equipped.
- b. One Class 500 Pumper fully equipped.
- c. One Class 325 Pumper fully equipped.
- d. One training building.
- e. One hose loader.

4. INFORMATION PROCEDURE.

Read the following information:

Exterior fires are interpreted to mean those fires which have originated from the exposure of heat from another burning building or an outside fire. Exterior fires are also originated from interior fires which have communicated to the outside through windows, doors, ventilators, roofs, or any portions of the building, and commences to envelop the building with flame. Due to the intensity and magnitude of the exterior fire, large quantities of water should be used quickly to bring the fire under control. Sound judgment must be exercised when fighting exterior fires to prevent an "exposure fire." In some exterior fires, it is far better to protect exposure risks with the hose stream than to continuously attack the burning building.

The size-up of a fire means the making of a quick survey of the situation as encountered by the fire department upon arrival. Correct sizeup is of tremendous importance. Upon this, the size-up, the initial plan is based. The heaviest responsibility rests upon the first fire officer to arrive at the scene of an emergency.

The first steps of the size-up are the loca-

tion and general conditions of the fire. The next point is the occupancy of the building. The third step in the size-up is the exposure risk. The types of exposures encountered involve both life and property.

Personnel on the leeward side of the fire may be exposed to dangerous fumes and gases thrown off by the fire.

Properties directly across the street or adjacent to the fire building are fire exposures. The direction of the wind will determine in which direction the greater exposures are located. In covering exposures, first attention will be given to the more seriously exposed hazards.

Means of confining the fire to the building in which it is burning or protecting exposures is accomplished by use of water streams. The size of the water streams are of great importance. Read paragraph 29, sections a and b, page 59, of TM 5-692, and section X paragraph 34, sub paragraph b, page 64, of TM 5-692.

When responding to an exterior fire, the first fire company to arrive will lay a hose line to cover the most hazardous exposure, which is normally on the leeward side of the fire.

The second line will be utilized to cover the exposures on the windward side of the fire.

The third line will be utilized to attack the fire.

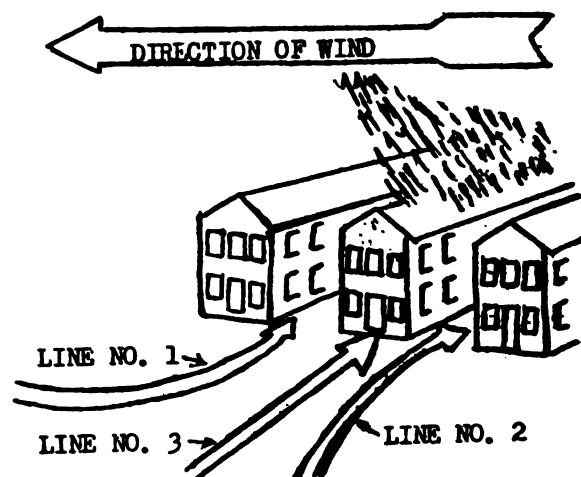


Figure 1.

EVALUATION (Self).

- (1) What is meant by size-up?
- (2) Upon what is the success of the operation based?
- (3) Why is a correct size-up of tremendous importance?
- (4) Who assumes the greatest responsibility at the scene of the emergency?
- (5) What is the first step in making a size-up?
- (6) How many types of exposures are encountered?
- (7) What consideration should be given to the wind direction?
- (8) How is the fire confined to the building in which it is burning?
- (9) Where should the water be applied on the fire to be most effective?
- (10) Why is the first line laid to cover the exposure on an exterior fire?
- (11) Where are the most hazardous exposures located at an exterior fire?
- (12) What line is generally used to initiate extinguishment of exterior fire?

Your Instructor will demonstrate size-up and covering exposures as heretofore outlined.

SALVAGE OPERATION. The procedure for performing salvage operations on exterior fires are similar to those of interior fires.

OVERHAUL AND PRESERVATION OF EVIDENCE. After extinguishment, an over all inspection must be made to determine whether all of the fire has been extinguished. Do not molest the contents anymore than is necessary, and never remove any articles from the building until approval is given by the fire office in charge. The less contents are moved, the better chance the investigating party has to determine the cause of the fire.

EVALUATION (Self).

- (1) What is the purpose of salvage covers?

- (2) What is meant by overhaul and investigation?
- (3) What is the purpose of the preservation of evidence?
- (4) When will the fire fighter remove contents from the building?

Your Instructor will demonstrate salvage, overhaul, and preservation of evidence in exterior fires.

5. PRACTICAL PROCEDURE.

Your position will be designated, and you will be assigned to a crew of four by your Instructor on a designated pumper.

You will assist in filling the booster tank on the truck.

You will assist in performing the daily inspection on an assigned Pumper.

You will assist in loading the Class 750 Pumper with 1,000 feet of 2½-inch hose by using the "horseshoe load" with the skid load finish.

The Class 750 Pumper will be the first truck to arrive. You will assist in making a reverse hose lay, and will respond upon a signal from your Instructor.

You will assist in covering the lee-side exposure as outlined in Informational Procedure.

You will assist in loading the Class 325 Pumper with 600 feet of 2½-inch hose by using the "accordion load" with a doughnut roll finish.

The Class 325 Pumper will be the second truck to arrive. You will assist in catching the Class 750 Pumper and making a straight hose lay by using the booster line, and will respond upon a signal from your Instructor.

You will assist in covering the windward side exposure as outlined in Informational Procedure.

You will assist in loading the Class 500 Pumper with 1,000 feet of 2½-inch hose by using the "horseshoe load" with a skid load finish.

The Class 500 Pumper will be the third truck to arrive. You will assist in catching

the Class 750 Pumper and making a straight hose lay by use of the booster line. You will respond upon a signal from the Instructor.

You will assist in attacking the burning building as outlined in Informational Procedure.

You will assist in performing salvage operations.

You will assist in performing overhaul operations of the entire fire area.

You will call to the attention of your instructor any conditions or material which might disclose the cause of the fire.

You will assist in reloading hose and equipment on the designated Pumper and drive to the area designated by your Instructor.

You will assist in performing after-each-run inspection and maintenance of the assigned Pumper.

EVALUATION (Self).

- (1) Why was the Class 750 Pumper used at the hydrant rather than the other trucks?
- (2) Why did the first truck cover exposures on the leeward side of the fire?
- (3) Where is the line on the second truck connected?
- (4) What exposures does the second truck cover?
- (5) Why is overhaul necessary after extinguishment?
- (6) Why is it necessary to preserve evidence?

6. CRITIQUE.

The Instructor will conduct a critique of this training project outline and summarize the following key points:

- (1) Size-up.
- (2) Covering exposures.
- (3) Salvage operations.
- (4) Extinguishing the fire.
- (5) Overhaul.
- (6) Preservation of evidence.

You will assist in performing maintenance on the hose and equipment used in this project.

7. GRADING POINTS.

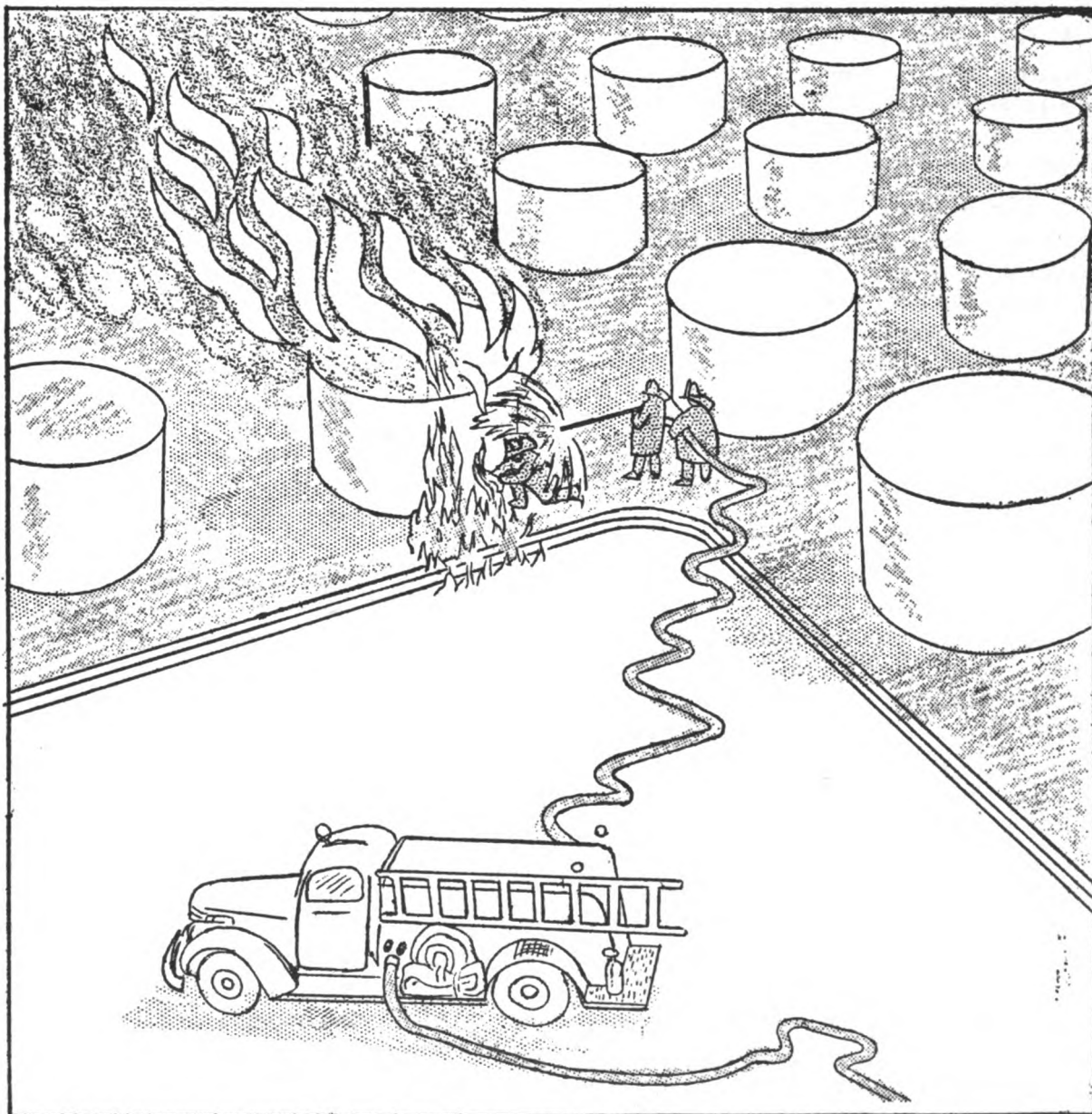
Grading points	Above average + 1	Average 0	Below average - 1
1. Did student use correct procedure for making size-up?			
2. Were exposures on the lee-side covered first?			
3. Which truck covered exposures on the windward side?			
4. Was the attack of the fire made properly?			
5. Were correct procedures used for overhaul?			
6. Did the student report any evidence?			
7. Were exposure lines used intermittently on burning building?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

GASOLINE TANK FIRES

PART I



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

- a. The procedure for making a size-up on gasoline tank fire.
- b. The methods of control and the extinguishment of gasoline tank fires.
- c. The procedure for making the overhaul, and the preservation of evidence.

2. EQUIPMENT.

- a. One Class 750 Pumper fully equipped.
- b. One trainer gasoline tank.
- c. One fire foam-making unit, backpack, low pressure, type A, 100 to 200 pounds, 5-gallon capacity, for 2½-inch fire hose, national standard fire hose.

3. INFORMATIONAL PROCEDURE.

Gasoline tank fires are considered in two separate categories. They are the open-top type and the filler manholes type.

SIZE-UP. Size-up means the making of a quick survey of the situation upon arrival. A quick but thorough size-up is of vital importance. The operation is based upon the size-up. The first fire office to arrive will make the size-up and assume the initial responsibility.

The first step of a size-up is the location and condition of the fire. The next step is the exposure.

The two types of exposures are life and property. The direction of the wind will determine the exposure requiring immediate attention.

EVALUATION (Self).

- (1) Why should the approach be made from the windward side?
- (2) Why should we consider the direction of the wind when making a size-up.
- (3) What are the two types of gasoline tank fires?

CONTROL AND EXTINGUISHMENT.

The two extinguishing agents which will be used to extinguish the gasoline tank fires are water fog and foam.

WATER FOG. When water fog is being used, the fog must be applied from a near vertical plane. The 12-foot applicator will be used. A Pumper line will be laid to the gasoline tank fire and the 12-foot applicator attached to the nozzle. Approach the gasoline tank fire by keeping the fog pattern between you and the fire at an angle to afford the greatest protection. Control the ground fire and close the valves which are leaking gasoline. As soon as the ground fire has been controlled and the source of the supply stopped, raise the fog applicator above the tank and extinguish the fire in the gasoline tank.

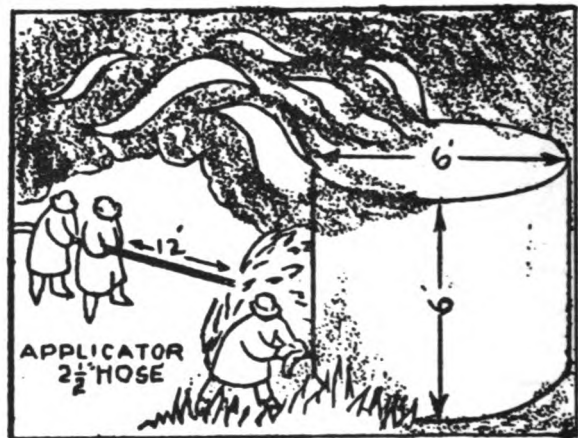


Figure 1.

EVALUATION (Self).

- (1) Why is the fire on the ground controlled first?
- (2) In what position is the fog pattern held when approaching the fire?
- (3) How far above the fuel is the fog pattern held?

Your Instructor will demonstrate, with your assistance, the size-up, control, and the extinguishment of a gasoline tank fire with water fog. *NOTE:* Instructor will cause a fire to be started in the gasoline tank fire trainer.)

- (1) Use 750 Pumper and make a reverse lay.
- (2) Connect 12-foot applicator to 2½-inch nozzle.

- (3) Approach tank fire with fog pattern between operator and fire.
- (4) Control ground fire around valve.
- (5) Close valves on the tank.
- (6) Extinguish the ground fire.
- (7) Extinguish the tank fire by:
 - (a) Raising the applicator above the tank.
 - (b) Lowering the fog pattern to just above the base of the fire.
 - (c) Move the applicator around at the top of the tank until the fire is extinguished.

OVERHAUL. Inspect the tank and the area to determine that all fire has been extinguished, and cool the tank to prevent reignition.

FOAM. When foam is used, attach the foam nozzle to the 2½-inch hose line, then attach a siphon foam line from the back-pack unit to the foam nozzle, and don the back-pack unit. The same hose line laid for the fog applicator will be used for this project. While approaching the fire, deflect the foam stream from the ground at the near edge of the fire and control the fire around the valve. Close the valve. Extinguish the remaining

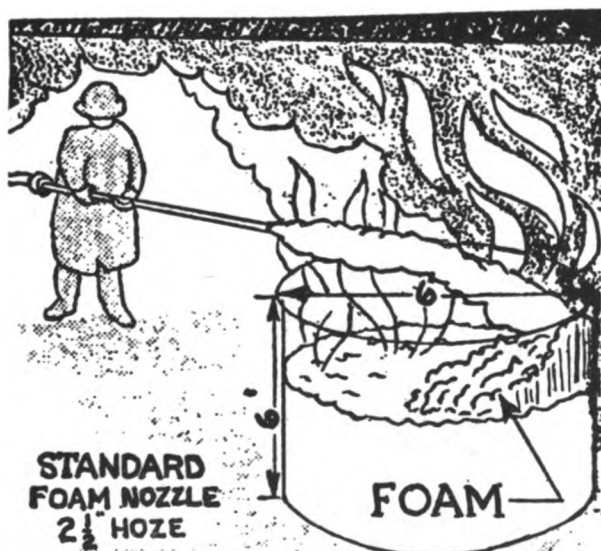


Figure 2.

ground fire and then raise the foam nozzle to a level where the foam stream can be deflected from the inside wall of the tank. The foam will flow over the burning gasoline and extinguish the fire.

EVALUATION (Self).

- (1) Where will the foam pattern be directed when extinguishing the fire inside the tank?
- (2) What effect does the foam have upon the fire?

Your instructor will demonstrate, with your assistance, the controlling and extinguishing of a gasoline tank fire with foam.

(NOTE: Instructor will cause fire to be started in the gasoline tank fire trainer.)

- (1) Use the same hose previously laid.
- (2) Connect the foam nozzle to the 2½-inch line.
- (3) Attach siphon foam line from the back-pack unit to the foam nozzle and don the back-pack unit.
- (4) Signal for the pumper operator to open the discharge valve to charge the line.
- (5) Control the ground fire around the valve.
- (6) Close the valve on the tank.
- (7) Extinguish the ground fire.
- (8) Extinguish the tank fire by:
 - (a) Raising the foam nozzle above the tank.
 - (b) Deflect foam from the far inside wall of the tank.
 - (c) Continue the application of foam until the fire is extinguished, then signal for the valve to be closed on the hose line.

OVERHAUL. The overhaul procedure is the same as outlined in the use of water fog.

EVALUATION (Self).

- (1) What effect does foam have on a gasoline tank fire?

- (2) How is the foam applied to a gasoline tank fire?

5. PRACTICAL PROCEDURE.

You will be assigned to a crew of four and your Instructor will designate your position on the Class 750 Pumper.

You will assist in filling the booster tank.

You will assist in loading the Class 750 Pumper with 1,000 feet of 2½-inch hose, using the "accordion load" and the doughnut roll finish.

You will assist in checking the foam unit and determining that the back-pack container is full of foam.

Your Instructor will designate the simulated fire station and the area of this operation.

You will rotate to each position until you have performed the duties of:

- (1) Crew chief.
- (2) Pump Operator.
- (3) Plugman.
- (4) Nozzleman.

You will assist in controlling and extinguishing gasoline tank fire using fog and foam as demonstrated by your instructor.

You will assist in reloading the hose and equipment.

EVALUATION (Self).

- (1) What is the procedure for extinguishing a gasoline fire with fog?
- (2) What is the procedure for extinguishing a gasoline tank fire with foam?
- (3) What procedure is used for overhaul?
- (4) Why should the ground fire be extinguished before extinguishing the gasoline tank fire?
- (5) Where is the first point of attack on a gasoline tank fire?

6. CRITIQUE.

Your Instructor will conduct a critique and stress the following key points.

- (1) Control of heat by water fog.
- (2) Stopping flow of fuel by shutting off valve.
- (3) Extinguishing ground fire by the use of water fog.
- (4) Extinguishing fire in the tank with water fog.
- (5) Use of the foam nozzle.
- (6) Control of the fire with foam.
- (7) Extinguishing ground fire with foam.
- (8) Extinguishing tank fire with foam.

You will assist in performing maintenance on the hose and the equipment used in this operation.

7. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student approach the fire with water fog correctly?			
2. Did the students shut off the gasoline valve properly?			
3. Was the ground fire extinguished before extinguishing the tank fire?			
4. Did the student deflect foam stream from the ground on approaching tank to control ground fire around leaking valve?			
5. Did the student deflect the foam from the far edge of the tank properly?			
6. Did the student inspect the area and tanks thoroughly during the overhaul?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
STRUCTURAL FIRE FIGHTING BRANCH

AUTOMOBILE FIRES

PART II



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

- a. The procedure for making a size-up.
- b. The method of rescuing personnel and the employment of safety measures.
- c. The control and extinguishment of the automobile fire.
- d. The overhaul and the preservation of evidence.

2. EQUIPMENT.

- a. One Class 500 Pumper Truck fully equipped.
- b. Two dummies.

3. INFORMATIONAL PROCEDURE.

The automobile fire is somewhat similar to aircraft fires in that the primary fuel is gasoline; however, due to the relatively small amount of gasoline carried, the automobile fire is in a separate category. Regardless of the source of heat which ignites the gasoline in the automobile, the fire is generally centralized around the engine, usually in the vicinity of the carburetor and/or fuel line. Like other types of fires, the primary objective is to rescue personnel and then extinguish the fire. The stopping of the fuel supply can be effectively done by crimping the fuel line, and in many cases, the use of the hand foam and CO 2 extinguishers from the Pumper are sufficient for complete extinguishment.

SIZE-UP. Automobile fires, like all other types of fires, must be evaluated while approaching the positioning. Some of the more important points to be observed are:

- a. Approach with extreme caution to prevent running over injured personnel who may have been thrown or who may have crawled away from the automobile fire.
- b. Determine the degree and extent of burning.
- c. Determine the rescue requirements.
- d. Determine the exposure risk.
- e. Formulate the attack plan.
- f. Determine the location for the Pumper truck.

CONTROL THE FIRE. Control the fire around the body of the car and force open the doors by the use of the door opener between the door and the frame.

RESCUE OF PERSONNEL. Enter the vehicle, grasp personnel under the arm pits, and remove them from the vehicle. The injured person should be dragged with his face upward. Use the utmost care to prevent additional injury during rescue.

STOP THE FLOW OF FUEL. Crimp the fuel line with the side-cutter or pliers.

EXTINGUISH THE FIRE. The remaining fire can be extinguished with a hand foam and CO 2 extinguisher or the foam hip-pack booster hose line unit.

OVERHAUL THE FIRE. Inspect and extinguish any resultant fires by checking with bare hands for hot spots.

PRESERVE THE EVIDENCE. Evidence that is generally available in automobile fires are cigarette butts within the upholstery of the vehicle or defective fuel or electrical lines.

EVALUATION (Self).

- (1) How are automobile fires similar to aircraft fires?
- (2) Why is the automobile fire easier to control than the aircraft fire?
- (3) Where is the fire generally located in an automobile?
- (4) How is the fuel in the ruptured fuel line shut off?
- (5) What tool can be used to force the doors open on an automobile?
- (6) Why are the hand extinguishers capable of extinguishing an automobile fire?
- (7) What unit is available on the pumper if the hand extinguishers are incapable of extinguishing the fire?
- (8) Why is it necessary to use the bare hands in performing the overhaul inspection?

Your Instructor will demonstrate, with your assistance, the following:

- (1) Size-up.
- (2) Control of the fire.
- (3) Forcible entry.
- (4) Rescue of personnel.
- (5) Stopping the flow of fuel.
- (6) Extinguishment.
- (7) Overhaul and investigation.

4. PRACTICAL PROCEDURE.

Your Instructor will assign you to a crew of 4 men on the Class 500 Pumper and designate your position on the truck.

You will assist in filling the booster tank.

Your Instructor will designate the area for training operations.

You will rotate each position until you have performed the duties of:

- (1) Crew chief.
- (2) Pump operator.
- (3) Plugman.
- (4) Nozzleman.

You will assist in:

- (1) Making size-up.
- (2) Controlling the fire.
- (3) Rescuing dummy personnel.
- (4) Stopping the flow of fuel.
- (5) Extinguishing the fire.
- (6) Overhauling and preserving evidence.

You will assist in reloading the Class 500 Pumper with the booster line and equipment.

EVALUATION (Self).

- (1) What precautions should be exercised in approaching an automobile fire?
- (2) What are the procedures to be followed in rescuing personnel and extinguishing the fire on a burning automobile?

6. CRITIQUE.

The Instructor will conduct a critique of this training project outline and summarize the following key points:

- a. Amount of fuel carried in an automobile.
- b. General location of the fire in an automobile.
- c. Precaution to be exercised when approaching an automobile fire.
- d. Procedures for rescue of personnel and extinguishment of fire.

You will assist in performing maintenance on the equipment and the hose used in this project.

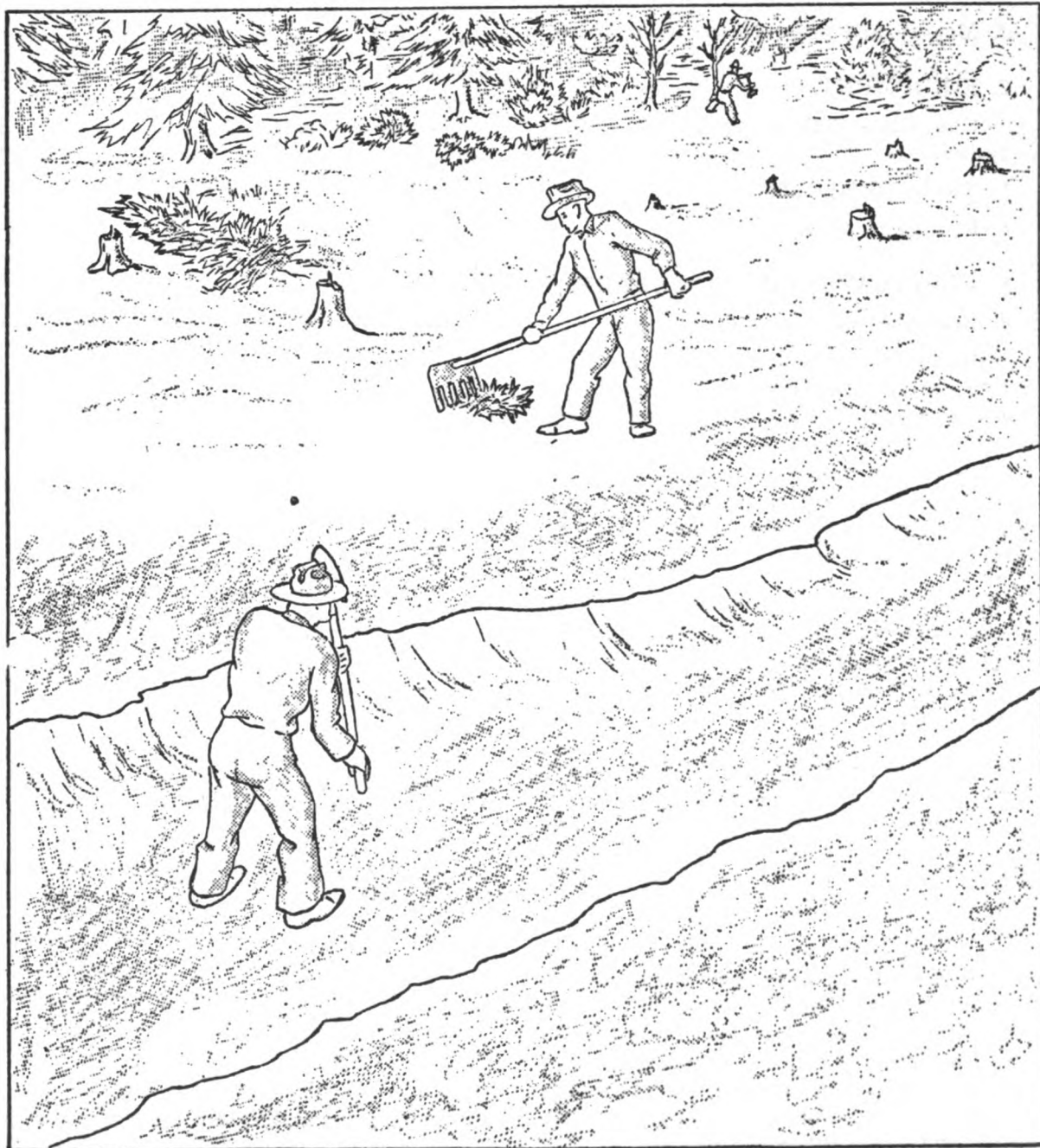
7. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student exercise caution when approaching the automobile?			
2. Did the student position the truck properly?			
3. Did the student control the fire properly?			
4. Did the student rescue dummy personnel by grasping them under their arm pits?			
5. Was the dummy dragged from the vehicle with his face upward?			
6. Did the student crimp the fuel line properly?			
7. Was the fire extinguished properly?			
8. Did the student use his bare hand when checking for heat?			
9. Did the student present any evidence found?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH

NATURAL COVER FIRES
PART III



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you :

- a. Procedure for making a size-up.
- b. Methods of rescuing personnel and employing safety measures.
- c. Control and extinguishment of natural cover fires.
- d. Mop-up and preservation of evidence.

2. EQUIPMENT.

- a. One Class 325 Pumper Truck fully equipped.
- b. Twelve long-handle shovels.
- c. Four bales of hay.

3. INFORMATIONAL PROCEDURE.

- a. Read the following information :

Natural cover fires are the most devastating to our natural resources and wild life. Many of our Air Force Bases present natural cover risks in varying degrees. Aircraft crashes are the source of some natural cover fires. Natural cover fires are divided into the following four categories: ground, surface, crown, and spot fires.

GROUND FIRES are fires which travel at ground level under leaves, humus, peat, and other organic materials which have become a part of the soil. This type of fire moves slowly.

SURFACE FIRES are fires in grass, weeds, grain, brush, and shrubs. This type of fire travels rapidly if the wind is high and the fuel is in abundance. The heat is intense but short lived because of the flash burning of these fuels.

CROWN FIRES are the most devastating type of forest fires. They spread through the tops or crowns of trees. A crown fire which generates enough heat to carry itself from crown to crown is called a "running" crown fire. One which depends upon heat from the accompanying ground fire for its spread is called a "dependent" crown fire.

SPOT FIRES are fires started in advance of the main body of fire by windblown sparks or bits of burning materials. Spot fires can also be caused by rolling burning material or burning logs and trees floating down streams coming to rest on the bank some distance from the original fire. This creates a dangerous situation. A number of spot fires may merge and cause a new head in advance, to one side, or even to the tail of the main fire. Men and equipment may be trapped between these fires, and large losses may result. A well-organized crew must be on the alert to locate spot fires and get them under control before any damage results.

A natural cover fire consists of four parts. They are as follows :

- (1) **FIRE LINE.** Natural cover fires move rapidly. The perimeter or fire line is the hottest part of the fire. The interior is a smoldering mass with only a few flames and many glowing embers or sparks. Natural cover fires are best controlled along the fire line.
- (2) **HEAD.** The point where the fire is progressing the fastest is called the head. A natural cover fire may have several heads, depending on the type, abundance, and location of fuel. Fire heads generally travel with the wind.
- (3) **FLANK.** All portions of the fire line between the head and the tail are called flanks. The burning section between the heads is called a flank.
- (4) **TAIL.** The tail is the upwind portion of the fire. This is the point where the progress of the fire is the slowest. This is usually near the origin of the fire.

Following is a diagram showing how a natural cover fire is classified.

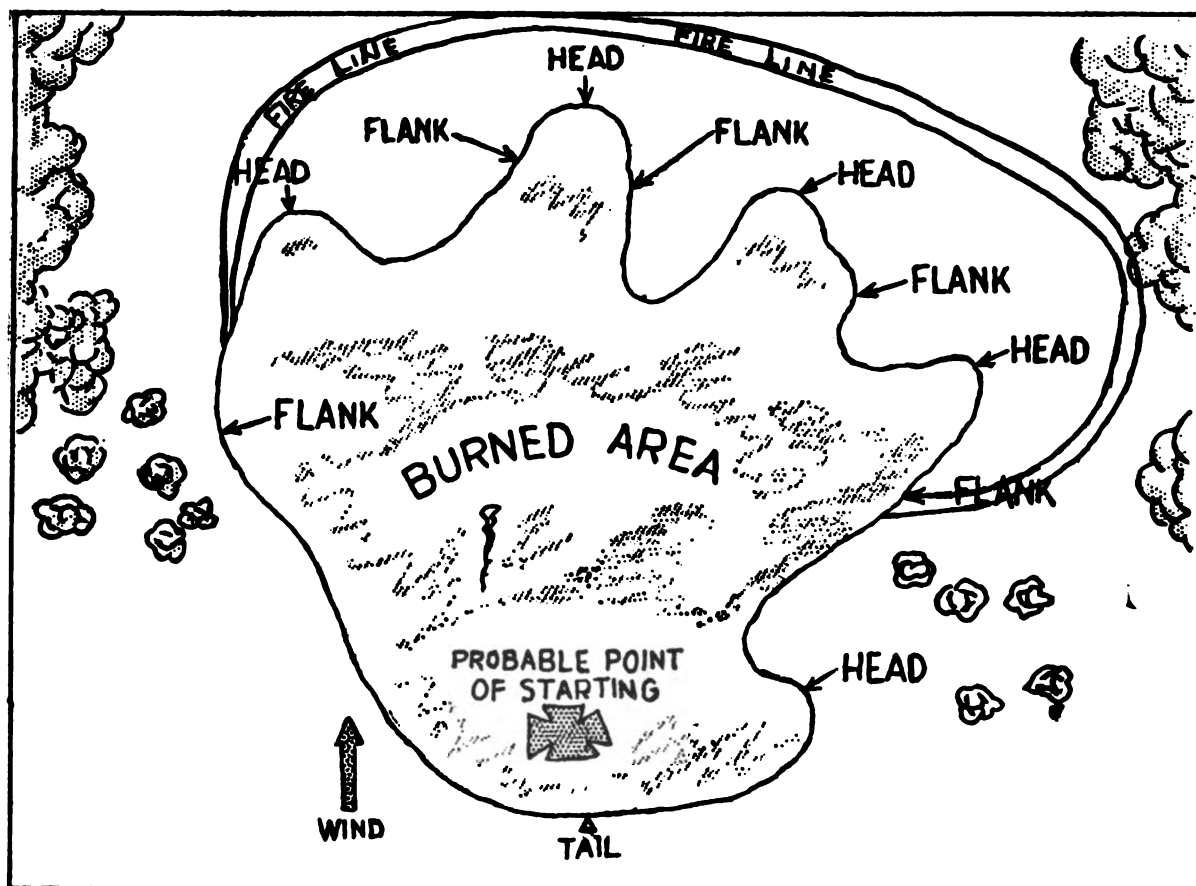


Figure 1.

The steps in the size-up of a natural cover fire are as follows:

- (1) Determine the size of the fire.
- (2) Determine the wind direction.
- (3) Determine what kind of fuel the fire is burning and toward what kind of fuel it is headed.
- (4) See if there are any natural barriers near by to help stop the fire such as streams, roads, plowed fields, or burned out areas.
- (5) Determine the hot spots, where the fire is burning the fastest and where it may jump or throw sparks into a new supply of fuel.

The most important consideration in fighting a natural cover fire is to choose the proper point from which to begin the attack.

Personnel should be evacuated from the fire area as soon as possible, always keeping in mind that they should be moved from the downwind side. The choice of this starting point must not be made haphazardly, but must be based upon a careful analysis of the existing and prospective conditions of the fire as determined by fuel conditions, weather conditions, and topography.

The aim in the initial attack is to stop the spread of the fire as quickly as possible. If there are numerous spot fires ahead of the main blaze which may "take-off", they may warrant first attention. Otherwise, as a general rule, the attack should begin at the point or points where the fire is spreading or will spread most rapidly under the worst conditions. Such points would be the side of the hill adjacent to accumulations of highly in-

flammable fuel, the uphill side of a fire on a steep slope, or the side of the fire which is or will be driven by the prevailing wind.

Attacking a fire directly at its head is possible only when the fire is not advancing rapidly and when a large number of men are available. Working directly in front of a rapidly advancing fire is hazardous and there is always the possibility that the fire may out-flank control lines. It is much better in such instances to begin work at safe points on the flanks and work toward the head. All of these things must be considered in the size-up, and carelessness will result in delaying extinguishment of the fire, increased loss, and possible injury to personnel.

EVALUATION (Self).

- (1) What are the four categories of natural cover fires?
- (2) What is a spot fire? How does it originate?
- (3) What is the difference between a ground and a surface fire?
- (4) Where is the fire line located?
- (5) What is meant by hot spots?
- (6) From where should the personnel be evacuated?
- (7) What is the initial aim in fighting a natural cover fire?
- (8) When is it advisable to make a direct attack on the head?
- (9) What is a crown fire?

CONTROL AND EXTINGUISHMENT OF NATURAL COVER FIRES. All but a few of the several hundred fires that start each year are controlled by a small crew of from one to five men. Occasionally, during periods of critically dry fire weather, a fire gets started in an area where there is a large amount of fast-burning fuel on the ground. Under these conditions, a fire may spread so rapidly that it becomes too large for a small crew to control.

The following information on how crews are organized and function on the larger fires will teach you how to work and fit into

an organization if called upon to help on a larger fire.

Regardless of the size of the fire, whether it be ten acres or a thousand, the steps to be taken to stop further spread, to provide as much safety for the fire fighter as possible, and to extinguish the fire are essentially the same. They are:

- (1) Clear brush and low limbs from the fire line.
- (2) Dig or scrape the fire line to fresh soil.
- (3) Fell burning snags near the fire line.
- (4) Burn out dry, unburned fuels between fire edge and fire line.
- (5) Hold fire inside fire lines until it dies down.
- (6) Mop-up fire and work on it until it is extinguished.

As the size of a fire increases and large numbers of men are needed to control it, three factors become increasingly important:

- (1) Organization and assignment of responsibilities.
- (2) Planning and supervision of the attack.
- (3) Effective use of manpower.

(The use of machinery might be mentioned as a fourth factor, but for the most part it is used to replace or supplement manpower.)

If fifty men were needed on a fire, the fire boss in charge would divide and organize his men into two 25-men crews, each with a foreman. On large fires, a sector boss is placed in charge of two to four foreman crews. As the size of the fire and crew increase, the fire boss may place a division boss in charge of two or three sector bosses. The division bosses are responsible for all action certain assigned parts of the fire boss who, in every case,

The first job of the fire boss is to be sure his crews have transportation to the fire, tools with which to fight the fire, and suf-

ficient food and drinking water. The principal job of the fire boss is to plan ways to get the fire extinguished in the shortest possible time. To accomplish this he will plan to:

- (1) Attack the danger spots first and do just enough work on them to stop the spread of the fire. This includes felling of dangerous snags.
- (2) Clear for and then build a fire line around the fire in the shortest possible time. This operation can be speeded by first building a narrow line and improving it if necessary after the spread of the fire is stopped. The smart fire boss will substitute railroad grades, roads, rock slides, and other barriers for constructed fire line wherever this can be done faster and safely without including too much unburned area.
- (3) Construct a fire line as close to the

edge of the fire as the men can work safely, and burn out the area between the fire line and the edge of the fire immediately.

- (4) Take advantage of the night and early morning for accomplishing most effective work. Promptly fell snags which might spread the fire in the heat of the day.
- (5) Keep a close watch for spot fires and put them out promptly when discovered.
- (6) Separate burning material, dig out burning roots, remove decomposed material from the fire line, widen the fire line where necessary, place burning logs parallel with slope to prevent them from rolling, and cut low-hanging or mossy limbs where there is a danger of ground fire igniting them and spreading to the crowns.

ORGANIZATIONAL CHART (NATURAL COVER FIRE FIGHTING)

FIRE BOSS

CREW BOSS

STRAW BOSS STRAW BOSS STRAW BOSS

Large fires are fought in the same way as small fires but they need more men and more and bigger equipment. Instead of one man or one small crew fighting the whole fire, that man or crew has only one special job to do, as part of a big team, on a big fire.

Three or four small crews of five or six men under strawbosses are grouped together under a crew boss. This crew boss may have to fight the whole fire with this crew, or he may be only one of several crew bosses with similar groups and be assigned to fight only a part of the fire.

CREW BOSS

STRAW BOSS STRAW BOSS STRAW BOSS

CREWS CREWS CREWS CREWS

Whoever is in charge of the fire is the fire boss, whether it is a straw boss with only his 5 or 6 men, or a crew boss with 5 or 6 straw bosses and their crews, or a sector boss with several crew bosses under him.

The fire boss is responsible for:

- (1) Lining up the crews and telling them where and how to work.
- (2) Planning the attack and bossing the job.
- (3) Making the best use of the manpower on hand.

- (4) Making the best use of equipment and tools.
- (5) Getting supplies, tools, food, and the rest needed.

The first warden at the fire is the fire boss until someone with more authority comes and relieves him.

- (7) Provide adequate drinking water on the fire line for the fire fighters.
- (8) If a camp is necessary, place it as close to the fire as possible and avoid hiking men long distances to and from work. Hiking wastes energy.
- (9) Have men either pack their lunch or provide them with a lunch on the fire line. Avoid hiking men to and from camp for their lunch.
- (10) Provide each crew with a first aid kit.
- (11) Establish an adequate service of supply which includes designation of a camp boss.

EVALUATION (Self).

- (1) What weather conditions aid in fighting natural cover fires?
- (2) What is the difference between stopping a small and a large natural cover fire?
- (3) Why is it necessary to organize and divide large fire fighting crews?
- (4) What are the principle responsibilities of the fire boss?
- (5) What portion of a natural cover fire should be attacked first?
- (6) How can railroads, roads, rock slides, rivers, and plowed fields be used in constructing a fire line?
- (7) When should the fire line be constructed?
- (8) What actions should be taken when burning roots are found adjacent to the fire line?

The following are methods of attacking different types of natural cover fires:

DIRECT ATTACK. This is performed

when the progress of the fire is slow, or the fuel is scattered and short and there are only small flames. In such cases, the heat is insufficient to drive the fire fighters away from the fire line. The initial attack may be on any part of the fire line under these conditions.

PARALLEL ATTACK. This attack is used on a fast-running fire in any type of cover to avoid intense heat and objectionable smoke. On a fire such as this, the initial attack is made on the tail of the fire while control units work along flanks and gradually close in to pinch out the head or heads.

EFFECTIVE USE OF MANPOWER. It has become general practice to use the "one lick" or progressive method for fire line construction. The key idea of this method is continuous forward movement of the clearing and digging crews. The method reminds one of a continuously moving freight train, each fire fighter being a box car.

The men assigned to clearing and digging are given the right tools (axes, pulaskies, hazel hoes, etc.), and lined out in a single file. They work 10 to 15 feet apart to avoid striking or getting in each other's way. In practice, they pause momentarily and take "one lick" at the material to be cleared, dug, or scraped, then step ahead one to several paces to repeat. The men hold their positions in the line and do not pass each other. The rate of forward movement depends upon the number of men in the line and the amount of work to be done. As each man moves forward, he does only a small amount of work needed to finish the line. The last man should complete the necessary work. Those ahead of the last man in each crew should stay out of his way, but they should not leave him with too much unfinished work. The last man in the crew automatically sets the pace for the crew.

For example, if one 25-men crew was sent to a fire, the fire boss would divide his crew into 3 units and assign them to jobs as follows:

In the first unit of 11 men, the most ex-

perienced man would lead off and locate the fire line, followed by 4 men clearing the line and 6 men digging.

In the second unit of 7 men, 4 would be felling dangerous snags along the line, and three would use torches to burn unburned material between the fire line and the fire edge.

Four of the 7 men in the third unit would hold the fire and keep it from crossing the line. The last three would begin the most urgent mop-up work next to the fire line. The objective of the whole crew would be to get a safe line around the fire as quickly as possible.

On a large fire, one or more foreman crews may be assigned to clearing and an equal number to digging. Another crew would fell snags. Several foreman crews would follow to "hold" the line and begin the mop-up. As a rule, on all but small fires the crews are divided and work on at least two sides of the fire.

INDIRECT METHODS OF CONTROL. Natural fire barriers are lakes, rivers, creeks, deserts, or bare rock formations. Other fire breaks such as roads, highways, survey lines, transmission lines, or cleared areas are effective barriers.

Fire breaks should be twice as wide as the height of the material in a given area. For example, trees that are 50 feet high will require a fire break 100 feet wide.

When back-firing, use extreme caution but do not hesitate because in so doing you may lose the control you have gained. Back-firing widens the fire break very fast and allows fire fighters greater control of the fire. In dry cover, fires may be started with matches, oil-soaked rags, gasoline, or flame throwers.

EVALUATION (Self).

- (1) What are the two types of attacks performed in fighting a natural cover fire?
- (2) What is the accepted method for constructing a fire line?

- (3) What is the approximate distance between men constructing a fire line?
- (4) What does the forward movement of the men constructing a fire line depend upon?
- (5) What is the purpose for constructing a fire line?
- (6) What are four indirect methods of control on natural cover fires?
- (7) What determines the width of a fire break?
- (8) What is meant by "back-firing"?

For the inexperienced man, woods work and fire fighting are dangerous tasks. However, a few simple precautions taken against specific hazards will enable the uninitiated to work in comparative safety.

ROLLING LOGS AND STONES. In rough country, rolling logs and stones are a constant hazard. All moveable dangerous logs should be turned so they cannot roll across the fire line. In the case of burning snags and logs, all crew members should form the habit of continually maintaining a sharp lookout for danger.

Water should be applied to the fastest advancing spots due to its extinguishing effect.

All fires are potentially dangerous until they are completely out. The object of mop-up work on fires is to put them out as quickly as possible. After the fire line has been constructed and the unburned material in the area between this line and the fire edge has been burned out, there is a tendency for the crew to relax or let down. As a result, many fires have gotten away after control appeared certain. Experienced fire bosses recognize the period immediately following the construction as one of the most dangerous and plan to have a holding crew work immediately behind the line construction crew. It is the job of the holding crew to cool down the fire and do the necessary work to prevent it from crossing the line. This is accomplished by throwing dirt to knock down the heat and flames, felling the last of the burn-

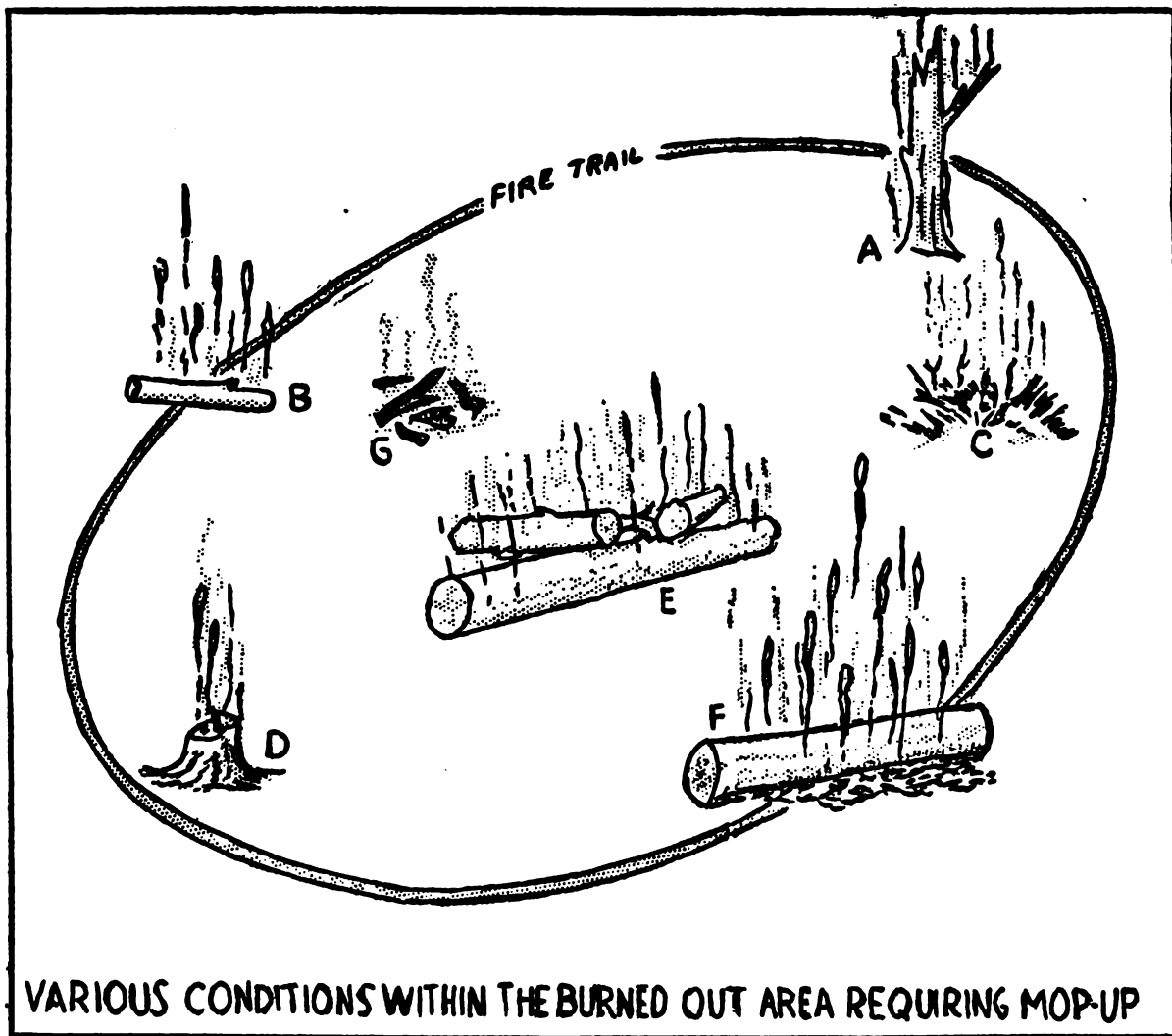


Figure 2.

ing snags that are throwing sparks across the line, looking for and putting out spot fires, and removing burning chunks, logs and hot burning fuels from near the fire line.

Before the fire crew may leave the fire, all burning material which might possibly cause the fire to cross the lines must be extinguished. On small fires, every spark must be extinguished for a distance far enough into the fire to prevent the fire escaping under any possible conditions. The drawing below will illustrate some of the more important factors to be considered in mop-up work.

The following are two methods to be given

consideration when trapped in natural cover fires. Whenever a ditch, creek, or river is in close proximity, utilize the near bank as a heat barrier as illustrated below:



Figure 3.

Another method is to ignite fuel and travel in same direction of fire as illustrated below:

MOP-UP AND PRESERVATION OF

- (2) Why are all natural cover fires potentially dangerous?
- (3) What precautions are taken after a fire line is built?



Figure 4.

EVIDENCE. Fire apparatus is of great value in fighting natural cover fires and should be used whenever terrains and road conditions will permit.

EVALUATION (Self).

- (1) What precaution is taken against rollings logs?

- (4) What is the purpose of a holding crew?
- (5) What would be your actions if trapped by a fast-burning surface fire where no ditches, rivers, or creeks were present?
- (6) When is the direct attack used?

- (7) Why is it important to have an avenue of escape when fighting a natural cover fire?
- (8) Why is the mop-up important on natural cover fires?
- (9) When is the mop-up operation complete?
- (10) When is the mop-up operation commenced?

SIZE-UP OF THE FIRE. Determine the size of the fire, the wind direction, the type of fuel that is burning, and toward what kind of fuel or other hazards it is headed.

STOP THE SPREAD OF THE FIRE. Make a direct attack from the flank and establish the fire line. Make a parallel attack, using the "one-lick" method, back-fire, and maintain the fire line.

EXTINGUISH SPOT FIRE. Give immediate consideration to the spot fires.

EXTINGUISH FIRE. Mop-up, see that all the fire is completely extinguished, spade up smoldering fuel, and cover with mineral soil.

PRESERVE ANY EVIDENCE. Preserve any newspaper, bottles, cans, or other evidence found which may have valuable information in determining the cause of the fire.

With your assistance, your Instructor will demonstrate size-up, make direct attack on fire line, confine the fire, mop-up, and preservation of evidence.

With your assistance, your Instructor will demonstrate the procedures for extinguishing grass fires by using the booster lines from the Class 325 Pumper Truck.

The attack will be made from the flank and extinguish the head and the flank from within the burned out area. Direct the stream of water in a near horizontal sweeping motion.

4. PRACTICAL PROCEDURE.

a. Your Instructor will designate your position and you will be assigned to a crew of five members.

b. You will assist in filling the booster tank on the Class 325 Pumper.

c. Your Instructor will designate the area to be used, and you will assist in preparing the area for use.

d. You will rotate each position until you have performed the following duties:

(1) Class 325 Pumper crew:

- (a) Crew chief.
- (b) Pump operator.
- (c) Plugman.
- (d) Nozzleman.

(2) Shovel Crew:

- (a) Crew chief.
- (b) Shovelman.
- (c) Shovelman.
- (d) Shovelman.
- (e) Shovelman.

PROBLEM NO. 1. SURFACE FIRE AND SPOT FIRES (GRASS). The Instructor will cause the fire to be ignited, and you will assist in:

- (1) Making a size-up. Outline the information gained through the size-up.
- (2) Making a direct attack on the fire edge from the flank and confining the fire.
- (3) Extinguishing spot fires.
- (4) Mopping-up the fire.
- (5) Preserving evidence. Give to your Instructor any material that may have value in determining the cause of the fire.

PROBLEM NO. 2 SURFACE AND SPOT FIRES (GRASS). The Instructor will cause the fire to be ignited, and you will assist in utilizing the Class 325 for extinguishing the grass fire by using the two booster lines.

PROBLEM NO. 3. CROWN FIRE. Your Instructor will designate two shovel crews of five men each and two dirt diggers. The Instructor will cause the fire to be ignited, and you will assist in utilizing the shovels

in throwing mineral soil to control and extinguish the snag fires.

You will assist in clearing the training area and reloading the Class 325 Pumper Truck.

You will assist in performing inspection and maintenance on the Class 325 Pumper Truck.

5. CRITIQUE.

a. Your Instructor will conduct a critique of this training project and summarize the following key points:

- (1) Types of natural cover fires.
 - (a) Ground.
 - (b) Surface.
 - (c) Spot.
 - (d) Crown.
- (2) Safety precautions.
 - (a) Ditches and streams.
 - (b) Burning out escape path.
- (3) Extinguishing agents.
 - (a) Mineral soil.
 - (b) Water.
- (4) Natural fire lines.
 - (a) Rivers and streams.
 - (b) Railroads and roads.
 - (c) Fire breaks and burned-out areas.
 - (d) Plowed fields.
- (5) The size-up.
 - (a) Determine the extent of the fire and the type of fuel that is burning.
 - (b) Determine the wind direction and its velocity, potential fuels that may be involved, and the exposure risks of life and property.
 - (c) Determine the method of attack.

- (6) Attack and confine the fire.
 - (a) Direct or indirect method.
 - (b) One-lick method.
 - (c) Back-fire.
- (7) Mop-up.
 - (a) Extinguish and/or secure the fire.
- (8) Preserve evidence.
 - (a) Newspapers, cigarette butts, and matches.
 - (b) Bottles and cans.
 - (c) Point of origin, highways, and railroads.
 - (d) Camp sites.

b. You will assist in performing maintenance on the equipment used in this training project.

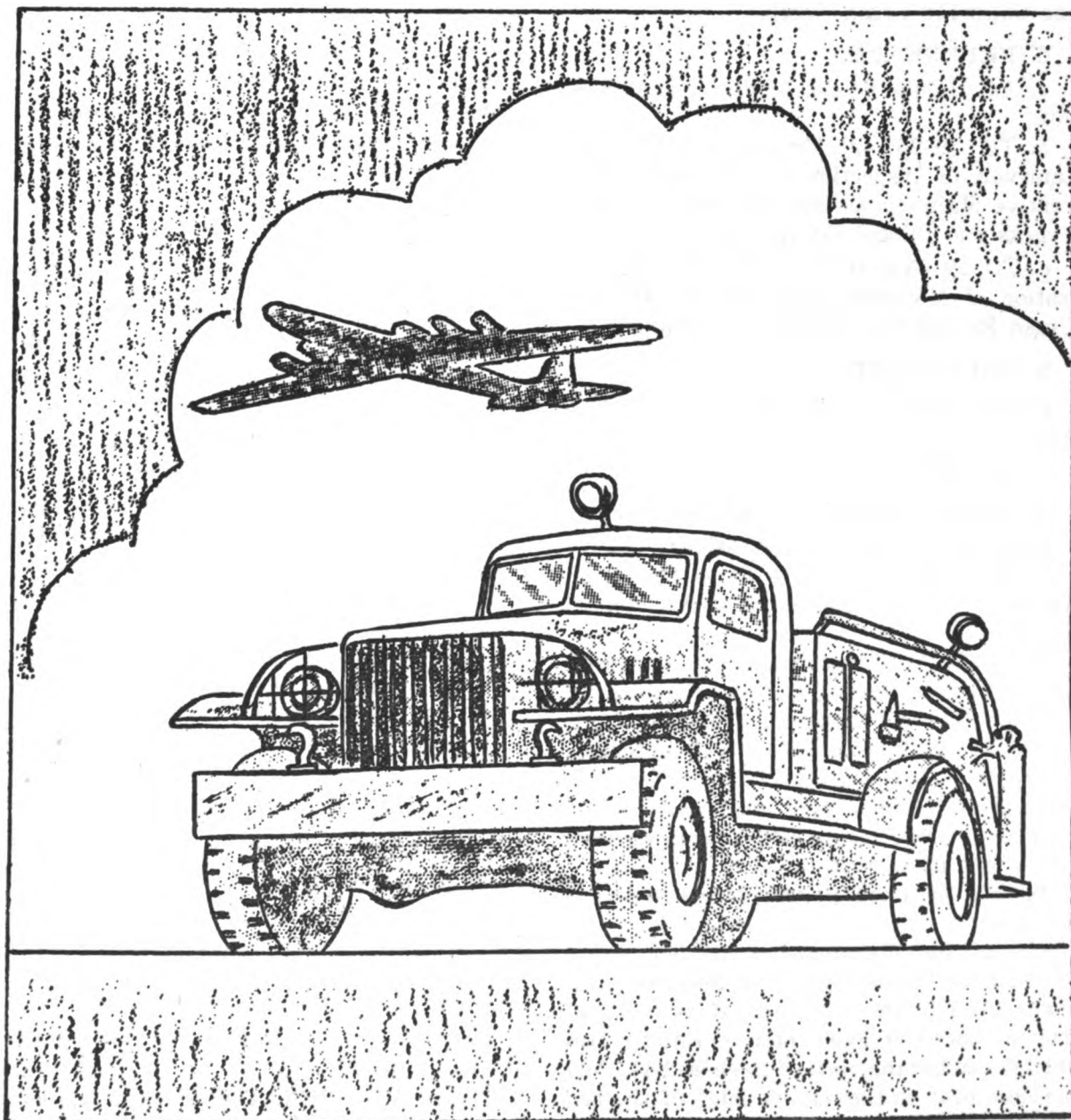
6. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student maintain the correct distance when developing the fire line?			
2. Were prescribed safety precautions practiced?			
3. Did the student extinguish the spot fires promptly?			
4. Did the student use the "one lick" method when developing the fire line?			
5. Did the student spade spot fires properly?			
6. Did the student use his hand in determining if the fire was out?			
7. Did the student back-fire from the fire line properly?			
8. Did the student use the booster line properly?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH

CLASS 110 CRASH TRUCK



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

- a. The identification and the nomenclature of the Class 110 Crash Truck.
- b. The operation (including individual duties of crew members) of the Class 110 Crash Truck.
- c. The maintenance (including polar) of the Class 110 Crash Truck.

2. REFERENCE.

- a. AF Manual 64-25, Aircraft Crash Rescue.
- b. TO 19-25A-9, Trucks and Trailers, Intervals of Inspection and Operation Preventive Maintenance Services on AF Crash Trucks and Piloted Equipment.
- c. TO 19-25A-41 Procedure for Winterization of Mounted Equipment on Aircraft Crash Rescue Fire Trucks and Trailers.

3. EQUIPMENT.

- a. One Class 110 Crash Truck fully equipped.
- b. One AF Form 42.

4. INFORMATIONAL PROCEDURE.

Read the following information:

For identification of the Class 110 Crash Truck, read pages 12 and 13 of AF Manual 64-25.

The Class 110 Crash Truck makes a head-on approach and positions at a near-diagonal on the nose or the tail of the aircraft. It has two foam lines, 100 feet each in length. Each foam line consists of two fifty-foot sections of 1½-inch hose. The hose is racked in a long, narrow hose bed located on each side of the foam tank.

To rack the lines the following procedures are used:

The left handline connects the female end of the hose to the wye gate. Make an oval shape bend in the hose, and start the hose into the hose bed. Feed the hose into the bed until it reaches the back of the hose bed. Fold the hose over to the outside edge of the bed and feed it out until it is approximately eight inches past the near edge of the hose bed.

This eight inches is called a "pigtail". Fold the hose back over the layer just laid, and feed the second layer back to the rear of the bed. Fold the hose over on the inside layer of hose and lay the second layer back and flush with the near edge of the hose bed. This procedure is carried out until the entire lengths of the hose are racked, making each layer fold flush with the near edge of the hose bed.

The right hoseline is racked by the same procedure as the left hoseline.

The CO 2 hoseline and reel are located at the rear of the truck between the two foam lines.

EVALUATION (Self).

- (1) Upon what type of chassis is the Class 110 Crash Truck mounted?
- (2) What is the capacity of the foam tank on the Class 110 Crash Truck?
- (3) What is the g.p.m. at 100 p.s.i. on the Class 110 Crash Truck?
- (4) What type pump is mounted on the Class 110 Crash Truck?
- (5) How many 50-pound CO 2 cylinders are mounted on the Class 110 Crash Truck?
- (6) What is the length of the CO 2 hoseline?
- (7) How many 50-foot sections of 1½-inch foam lines are on the Class 110 Crash Truck?
- (8) What is the length of each foam handline?
- (9) What position does the Class 110 Crash Truck assume at an aircraft emergency?

You will accompany your Instructor to the Class 110 Crash Truck, make a visual inspection of the truck, and learn the crew positions and the related equipment.

The crew consists of five men. Their positions and duties are:

The PUMP OPERATOR rides in the left side of the cab. He drives the truck and operates the pump.

The CREW CHIEF rides in the right side of the cab. He instructs the driver while enroute to the emergency, identifies the point of operation, and takes charge of the handlinemen and the rescueman at the scene of the emergency.

The RIGHT FOAM HANDLINEMAN rides on the right side of the rear platform and holds on to the guard rail. He removes all hose from the hose bed, goes to the point of the operation, and takes the position adjacent to and on the right of the crew chief.

The LEFT FOAM HANDLINEMAN rides on the left side of the rear platform and holds on to the guard rail. He opens the discharge valves on the wye gate while enroute to the emergency, removes all the hose from the hose bed, goes to the point of the operation and takes his position adjacent to and on the left side of the crew chief.

The RESCUEMAN rides on the rear platform between the foam handlinemen and holds on to the guard rail. He removes the crash kit and the CO 2 horn and carries them to the point of the operation. He opens the crash kit and lays the CO 2 horn on top of the opened kit. He carries out such other duties as assigned by the crew chief.

EVALUATION (Self).

- (1) Where does the pump operator ride?
- (2) What is the length of each foam handline?
- (3) How is the foam line racked in the hose bed?
- (4) Who removes the CO 2 horn?
- (5) Where does the crew chief ride?
- (6) Who opens the valves on the wye gate?

Your Instructor will demonstrate each crew member's position and duties.

The PUMP OPERATOR rides on the left side of the cab. He drives the truck, starting in first gear and double clutching to shift into other gears. He stops the truck smoothly, places the gear shift in neutral, places

the hinge lock in place to prevent the pump from jumping out of gear. He alights from the cab, grasping the outside throttle with the left hand and the tank dump valve with his right hand. He opens the throttle and the tank valve and simultaneously observes the pressure gauge. When the pressure gauge needle registers 100 p.s.i., he sets the throttle, and checks to see that the tank valve is opened completely. He opens the two doors exposing the four 50-pound cylinder valve ends. If CO 2 is not needed at the time, he goes to the rear of the truck and checks the wye gate valves to make sure they are open, assists in straightening out the kinks in the foam lines, and removes the first aid fire fighting equipment and places it at the point of operation. He makes frequent checks on the pump pressure and the foam supply remaining in the tank. When CO 2 is required, the pump operator places his left hand on the top-left CO 2 cylinder valve and his right hand on the top-right CO 2 cylinder valve and opens both simultaneously by turning both valves counter-clockwise. When additional CO 2 is required, he follows the same procedure as outlined for the top two valves. When this operation is completed, he closes both the top valves by reversing the procedure.

The CREW CHIEF rides on the right side of the cab. He gives instructions to the driver while enroute to the emergency. He alights from the truck after it has stopped, identifies the points of operation, and takes charge of the handlinemen and the rescueman.

The LEFT HANDLINEMAN rides on the left side of the rear platform facing the cab, and holds to the guard rail. He opens the valves on the wye gates upon the approach to the emergency. When the truck stops, he places his left hand in the "pigtail" loop and his right hand around the foam nozzle and the top layer of the hose. He steps off backward from the rear platform, and pulls off all of the hose from the bed, goes to the point of the operation, and takes his position adjacent to and on the left side of the crew chief.

The RIGHT HANDLINEMAN rides on the right side of the rear platform facing the cab, and holds to the guard rail. His duties are the same as those of the left handlineman except that he does not open the valves on the wye gate.

The RESCUEMAN rides on the rear platform between the right and the left foam handlinemen, facing the cab, and holds to the guard rail. He removes the CO 2 horn and the crash kit and carries both to the point of operation. He opens the crash kit and places the CO 2 horn on top of the opened kit. He carries out such other duties as assigned by the crew chief.

For charging the 50-pound CO 2 extinguisher, read TM 5-687, pages 36 to 43, paragraph 44.

EVALUATION (Self).

- (1) What is the percent of the rated weight of an extinguisher when it requires recharging?
- (2) What is the best position in which to place the cylinder when recharging?
- (3) What valve should be closed first when the extinguisher has been fully charged?

With your assistance, your Instructor will demonstrate recharging the 50-pound CO 2 cylinders as outlined in TM 5-687.

For information on daily, after-each-run, and weekly inspections and services, read sections 1 and 2, pages 1, 2, and 3, of TO 19-25A-9.

EVALUATION (Self).

- (1) What is the AF Form 42, and what is it used for?
- (2) How many consecutive daily inspections are made on a single AF Form 42?
- (3) Where are the after-each-run inspections entered on an AF Form 42?
- (4) What happens to the AF Form 42

when a crash truck is transferred from one base to another?

- (5) What items are checked on the daily inspection?
- (6) What items are checked on the after-each-run inspection?
- (7) What items are checked on the weekly inspection?

Your instructor, with your assistance, will demonstrate daily, after-each-run, and weekly inspections using an AF Form 42 as outlined in TO 19-25A-9.

For information on winterization, read paragraphs 1, 2, 3, and 4, pages 1, 2, 3, and 4, of TO 19-25A-41.

EVALUATION (Self).

- (1) Where should crash fire trucks be quartered?
- (2) What should be done with fire apparatus where heated buildings are not available?
- (3) What parts of the fire trucks need special protection?
- (4) What parts of the fire trucks need special attention when away from quarters?
- (5) What method can be used to protect the pumps and the lines?
- (6) What do we mean by "Drain System" in winterizing a crash truck?
- (7) How can the operator tell the approximate pressure when the gauges are frozen?

5. PRACTICAL PROCEDURE.

Your Instructor will assign you to a crew of five men, and you will be assigned to a position on the Class 110 Crash Truck. You will rotate until you have performed each crew member's duties.

You will assist in accomplishing the AF Form 42 on the Class 110 Crash Truck.

You will assist in filling the foam tank and 50-pound CO 2 cylinders on the Class 110 Crash Truck.

Your Instructor will designate the area to be used for this project and the distance to be traveled for each operation.

You will perform the duties of the following positions demonstrated by your Instructor.

- (1) Crew chief.
- (2) Pump operator.
- (3) Left handlineman.
- (4) Right handlineman.
- (5) Rescueman.

You will assist in performing inspection and maintenance of the Class 110 Crash Truck as outlined and demonstrated in Informational Procedure.

EVALUATION (Self).

- (1) What is the capacity of the pump on the Class 110 Crash Truck at 100 p.s.i.?
- (2) What is the required number of men for a crew on the Class 110 Crash Truck?
- (3) What procedure is used for loading the foam line on the Class 110 Crash Truck?
- (4) Who operates the pump on the Class 110 Crash Truck?
- (5) Where does the rescueman ride on the Class 110 Crash Truck?
- (6) What is the capacity of the foam tank on the Class 110 Crash Truck?
- (7) Who opens the CO 2 valves on the four 50-pound CO 2 cylinders on the Class 110 Crash Truck?
- (8) How long is the 1/2-inch CO 2 hose line on the Class 110 Crash Truck?

6. CRITIQUE.

Your Instructor will conduct a critique of this training project outline and summarize the following key points:

- (1) Identification of the Class 110 Crash Truck.
- (2) Operation of the Class 110 Crash Truck.
 - (a) Operation of the pump, and its capacity and pressure.
 - (b) Operation of the CO 2 cylinder valves.

(c) Loading and unloading of the hose.

- (3) Position of the crew members.
- (4) Duties of each crew member.
- (5) Inspection and maintenance of the Class 110 Crash Truck.
 - (a) Purpose and use of the AF Form 42.
 - (b) Filling of the foam tank.
 - (c) Recharging of the CO 2 cylinders.

You will assist in performing the "driver's" maintenance on the truck and equipment, including washing and polishing.

7. GRADING POINTS.

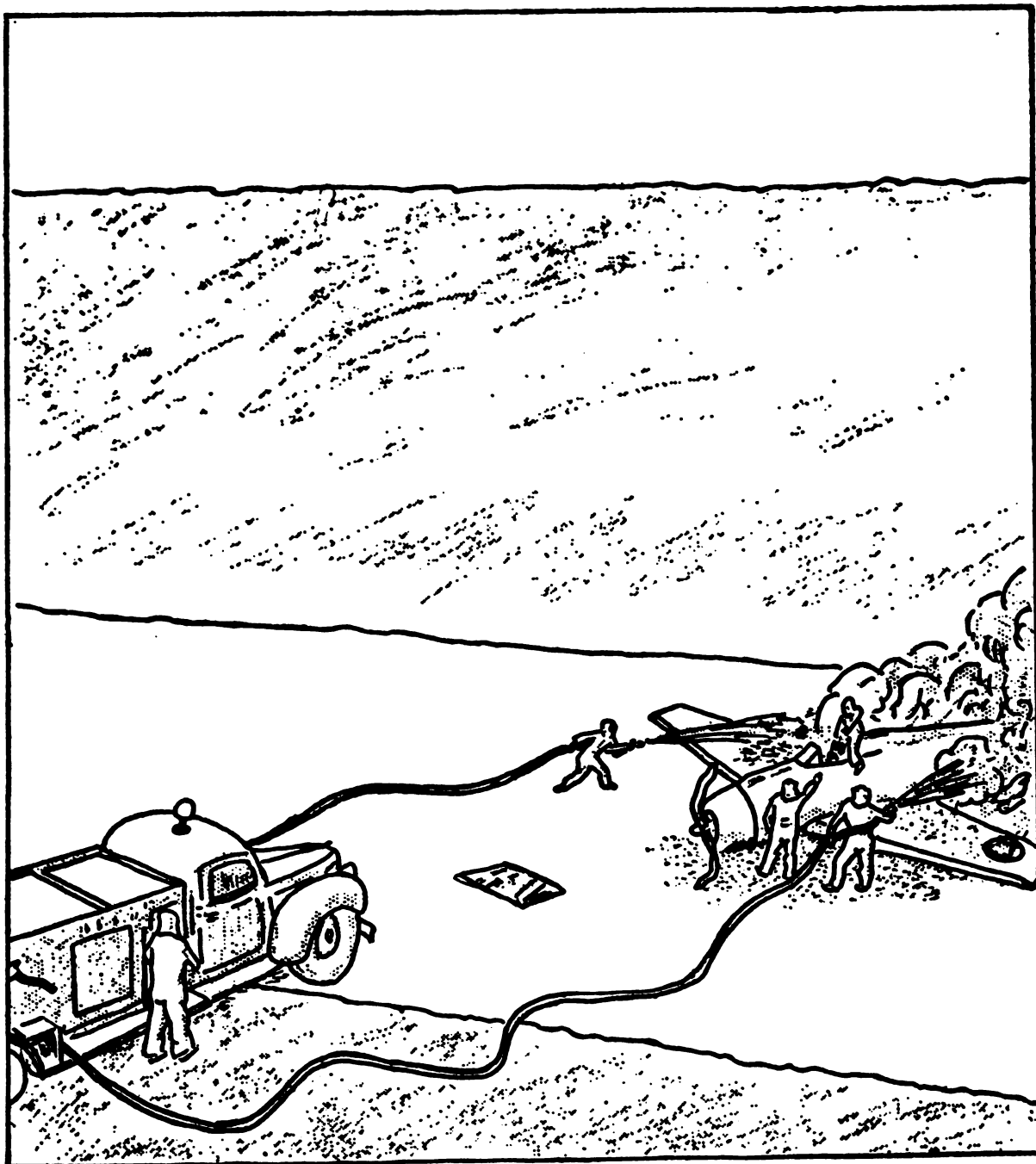
Grading points	Above average + 1	Average 0	Below average - 1
1. Did the crew chief remain on the truck until it stopped before alighting?			
2. Did the crew chief take charge of the handlinemen and the rescueman?			
3. Did the driver start the truck in first gear?			
4. Did the driver place the pump lever into gear before leaving the cab?			
5. Did the driver set the hand brake?			
6. Did the driver correctly obtain the desired pressure?			
7. Did the driver straighten out the kinks in the hose?			
8. Did the driver frequently check the amount of foam remaining in the tank?			
9. Did the left handlineman turn on the valves on the wye gate while enroute?			

Grading points	Above average + 1	Average 0	Below average - 1
10. Did the left handline- man remove all the hose from the hose bed?			
11. Did the left handline- man go to the left side of the crew chief and position himself properly?			
12. Did the right handline- man go to the right of the crew chief and position himself prop- erly?			
13. Did the right handline- man remove all of the hose from the hose bed?			
14. Did the rescueman re- move the crash kit and the CO 2 horn and carry them to the point of opera- tion?			
15. Did the rescueman stand by at the point of op- eration for further instructions from the crew chief?			
16. Did the student assist in the accomplishing of AF Form 42?			
17. Did the student assist in the maintenance of the hose and the equipment used in this training project?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH

CLASS 125 CRASH TRUCK



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

The identification and the nomenclature of the Class 125 Crash Truck.

The operation (including individual duties of crew members) of the Class 125 Crash Truck.

Inspection and maintenance procedures of the Class 125 Crash Truck.

2. REFERENCE.

AF Manual 64-25, Aircraft Crash Rescue.

3. EQUIPMENT.

One Class 125 Crash Truck fully equipped.

AF Form 42—Inspection and Preventive Maintenance Roster.

4. INFORMATIONAL PROCEDURE.

a. For identification of the Class 125 Crash Truck, read pages 10 and 11, of AF Manual 64-25, regarding the Class 125 Crash Truck. The Class 125 Crash Truck makes a head-on approach either on the nose or the tail and is positioned head-on.

b. EVALUATION (Self).

- (1) Upon what type chassis is the Class 125 Crash Truck mounted?
- (2) What is the capacity of the booster tank?
- (3) What type pump is mounted on the Class 125?
- (4) What are the lengths and number of handlines on the Class 125?
- (5) How many handlines are normally used?
- (6) What position does the Class 125 Crash Truck assume at an aircraft emergency?

c. You will accompany your instructor for a visual identification of the Class 125 Crash Truck, including equipment, appliances, and crew positions, starting from the left front of the truck and progressing clockwise.

The crew consists of five men. Their positions and duties are as follows:

- (1) The CREW CHIEF on a Bean Class 125 Truck is the driver. He starts the truck in first gear and stops in third gear, positioning head-on to the nose or the tail of the aircraft. He sets the emergency brake after the pump operator puts the pump in gear. He alights from the truck and sets up the handline-men at the point of operation. (On the Hardie Class 125 Crash Truck, the crew chief rides in the right side of the cab and puts the pump in gear before leaving the cab.)
- (2) The PUMP OPERATOR on the Bean Class 125 Crash Truck rides on the right side in the cab since the controls are on the right side. He puts the pump in gear, alights from the truck, and closes the churn valve with his left hand, turning it clockwise. He accelerates the engine by pulling and/or turning the hand throttle counterclockwise until the required pressure has been attained and the speed is from 14 to 18 m.p.h. as indicated on the speedometer. He then removes the third line from the truck and carries it to the front of the truck. He places the coil on the ground with the foam nozzle placed on the top. He returns to the truck, opens the discharge valve on the third line, ascertains that the left and right handline valves are open, and takes off the first aid fire fighting equipment. He checks the extinguishing agent in the tank and the pressure on the gauge. On the Hardie Class 125 Crash Truck, the pump controls are normally on the left side; therefore, the pump operator is the driver.
- (3) The RIGHT HANDLINEMAN rides on the right side of the truck, with the nozzle in his right hand, his left hand through the hose coil in the basket holding to the side of the hose basket. He makes sure that the

discharge valves are open on the right and left handlines. When the truck stops at the point of the operation, he alights with the nozzle in his right hand and the line around his back, with the remaining coil in his left arm. The lineman positions himself to the right of the crew chief at the point of operation.

- (4) The LEFT HANDLINEMAN'S duties are the same as for the right handlineman but he uses his opposite hand and arm.

NOTE: When discharging the extinguishing agent through the high-pressure nozzle, the nozzle will be held parallel to the ground.

- (5) The RESCUERMAN alights with the crash kit in his hand when the truck stops. He takes the crash kit to the front of the truck and unrolls it. He returns to the truck and removes the ladder. He takes the ladder to the front of the truck and positions it in an "A" position and awaits further orders from the crew chief.

d. EVALUATION (Self).

- (1) How many men make up a crew on the Class 125 Crash Truck?
- (2) Where does the crew chief ride on the Hardie Class 125 Crash Truck?
- (3) Where does the crew chief ride on the Bean Class 125 Crash Truck?
- (4) Where is the pump operator's position on the Hardie Class 125 Crash Truck?
- (5) Where is the right handlineman's position and what are his duties on the Class 125 Crash Truck?
- (6) Where does the rescuerman ride on the Class 125 Crash Truck?

e. Your instructor will demonstrate each crew member's position and his duties.

- (1) Crew chief (Bean and Hardie).
- (2) Pump operator (Bean and Hardie).

- (3) Right landlineman.
- (4) Left handlineman.
- (5) Rescueman.

5. PRACTICAL PROCEDURE.

a. Your instructor will assign you to a crew of five men, and your position will be designated.

b. You will assist in filling the tank on the Class 125 Crash Truck.

c. Your instructor will designate the area for the operation and the distance to be traveled on each operation. You will rotate on each position until you have performed the duties of:

- (1) Crew chief.
- (2) Pump operator.
- (3) Right handlineman.
- (4) Left handlineman.
- (5) Rescueman.

d. You will assist in performing inspection and maintenance on the Class 125 Crash Truck using Form 42.

e. EVALUATION (Self).

- (1) In what gear does the Bean Class 125 pump?
- (2) In what gear does the Hardie Class 125 pump?
- (3) Where does the crew chief ride on Bean Class 125?
- (4) What are the procedures for placing the Bean Class 125 into pump gear?
- (5) What are the duties of the handlinemen on the Class 125?
- (6) What are the duties of the rescuerman on the Class 125?

6. CRITIQUE.

a. The instructor will conduct a critique of this training project and will summarize the following key points:

- (1) The position of the Class 125 will be head-on.
- (2) The handlinemen will be positioned on either side of the fuselage.

- (3) The men will be crouched on the inside of the line.
- (4) The high-pressure nozzles will be positioned about 18 inches above the ground and parallel with the ground.
- (5) The desired pressure on the pump will be maintained at the slowest possible engine speed.

b. You will assist in performing "driver's" maintenance on the truck and equipment, including washing and polishing.

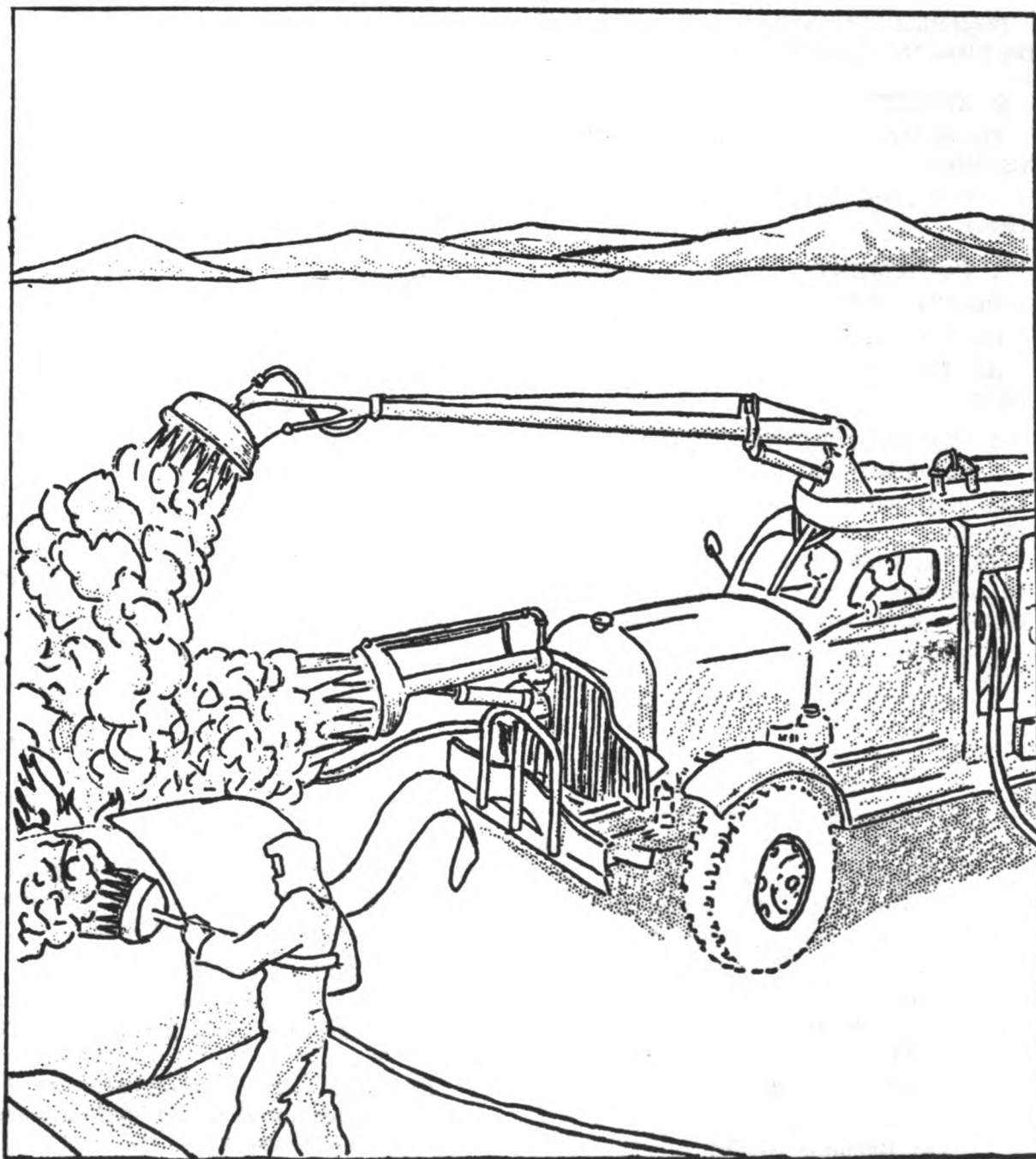
7. GRADING POINTS

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the crew chief perform his assignment properly during the operation?			
2. Was the student properly clothed before and during the operation?			
3. Did the driver start in the proper gear?			
4. Did the driver select the best route to the operation?			
5. Did the linemen set-up properly on the aircraft?			
6. Did the driver position the truck properly?			
7. Did the student rack the hose properly?			
8. Did the pump operator maintain the proper pressure?			
9. Did the rescueman carry out his duties properly?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWEY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH

CLASS 150 CRASH TRUCK



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

The identification and the nomenclature of the Class 150 Crash Truck.

The operation (including individual duties of crew members) of the Class 150 Crash Truck.

Inspection and maintenance procedures of the Class 150 Crash Truck.

2. REFERENCES.

TO 19-25A-2, Operation and Maintenance (Sterling).

TO 19-25A-3, Operation and Maintenance (Reo).

3. EQUIPMENT.

One Class 150 Crash Truck fully equipped.

One CO 2 storage unit.

AF Form 42, Inspection and Preventive Maintenance Roster.

4. INFORMATIONAL PROCEDURE.

a. For identification, read paragraph 2, section 1, pages 1 through 4, of TO 19-25A-3.

The Class 150 Crash Truck makes a head-on approach either on the nose or the tail of the aircraft and positions head-on.

b. EVALUATION (Self).

- (1) What is the overall height of the Class 150 Crash Truck?
- (2) What is the loaded weight of the Class 150 Crash Truck?
- (3) Where are the top boom, radiator nozzle, and ground sweep controls located?
- (4) What is the length of the top boom?
- (5) Upon what type chassis is the Class 150 Crash Truck mounted?
- (6) What position does this truck assume at an aircraft emergency?
- (7) What are the CO 2 discharge capacities of the following:
 - (a) Top boom?
 - (b) Radiator nozzle?

(c) Ground sweep?

(d) Playpipe?

(e) Bayonet nozzle?

(8) What are the foam discharge capacities of the following:

(a) Top boom?

(b) Radiator nozzle?

(c) Ground sweep?

(d) Side lines?

c. Read 19-25A-3, page 7, section II, paragraph 8 through page 9.

d. EVALUATION (Self).

- (1) At what pressure is the carbon dioxide maintained in the tanks of the Class 150 Fire Truck?
- (2) How is the carbon dioxide kept in a liquid form?
- (3) Where are the safety devices located?
- (4) At what pressure does the bleeder relief valve operate?
- (5) At what pressure does the pop-off-valve operate?
- (6) What is the purpose of the two-way switching valve?
- (7) At what pressure does the frangible disc rupture?
- (8) At what pressure limits does the refrigeration system maintain CO 2 in the tank on the Class 150 Fire Truck?
- (9) At what pressure does the alarm bell ring? Low? High?
- (10) Where are the two liquid level gauges located?

e. Read TO 19-25A-3, page 10, paragraph 13 through page 21, in regard to the Class 150 Sterling Fire Truck Foam Tank.

f. EVALUATION (Self).

- (1) What is the capacity of the foam tank on the Sterling Class 150 Fire Truck?
- (2) What is the working pressure on the foam tank on the Sterling Class 150 Fire Truck?

- (3) Where is the foam tank fill-plug located on the Sterling Class 150 Fire Truck?
- (4) What procedure is followed in determining whether the foam tank is full?
- (5) At what pressure is the safety valve set on the foam tank of the Sterling Class 150 Fire Truck?

g. Read TO 19-25A-3, page 10 through page 11, paragraph 13.

h. EVALUATION (Self).

- (1) What is the working pressure on the foam tank of the Reo Class 150 Fire Truck?
- (2) What is the capacity of the foam tank on the Reo Class 150 Fire Truck?
- (3) What is the opening near the top of the foam tank used for on the Reo Class 150 Fire Truck?
- (4) At what pressure is the safety valve set on the foam tank of the Reo Class 150 Fire Truck?

i. Read TO 19-25A-3, section II, pages 12, 13, and 14.

j. EVALUATION (Self).

- (1) What is the purpose of the two six-volt batteries located on the left running board?
- (2) Where is the battery charger located?
- (3) Where is the control panel located?
- (4) What do the pistol-shaped levers mounted on the control panel operate?
- (5) What do the triggers on the pistol levers control?
- (6) What do the buttons on the pistol levers control?
- (7) Where is the boom-lift knob located?
- (8) What is the purpose of the boom-lift knob?

- (9) What procedure is followed in opening the CO 2 and foam ground sweep?
- (10) Where, on the control panel, are the foam and CO 2 ground sweep control knobs located?

k. You will accompany your Instructor to the Class 150 Fire Truck for visual identification of the unit, equipment, appliances, and crew positions, starting from the left front of the truck and progressing clockwise.

1. Your Instructor will demonstrate the procedures of all crew positions.

- (1) The DRIVER rides in the left side of the cab, drives the truck, and places the front wheels and low range into operation.
- (2) The PANEL OPERATOR rides on the right side of the cab, with both hands on the pistol handle controls, forefingers on the triggers, and thumbs on the buttons.

He places his right hand on the boom lift-knob and pushes down to raise the boom approximately 16 inches. He places his right hand on the right-hand pistol handle and pushes toward the right, swinging the top boom, and places his right hand on the boom lift-knob and pulls up. To move the boom nozzle out, he places his right hand on the right-hand pistol handle and pushes down. To swing the top boom nozzle in, he pulls up on his right-hand pistol handle.

To discharge CO 2 from the top boom, he pulls the triggers on the right-hand pistol handle.

To discharge the foam from the top boom, he pushes the button on the right-hand pistol handle.

To position the top boom over the boom rack, he pushes the right-hand pistol handle to the left.

To lower the boom on the rack, he pulls up on the boom-lift knob.

He operates the radiator nozzle by placing his left hand on the left-hand pistol handle.

For positioning of the radiator nozzle, he pushes the left-hand pistol handle to the right.

To raise the radiator nozzle, he pushes down on the left-hand pistol handle.

To lower the radiator nozzle, he pulls up on the left-hand pistol handle.

To discharge the CO 2 radiator nozzle, he pulls the trigger on the left-hand pistol handle.

To discharge the foam from the radiator nozzle, he pushes the button.

To put the radiator nozzle back into position, he pushes the left-hand pistol handle to the left.

To discharge the CO 2 from the ground sweep, he places his left hand on the ground sweep discharge control knob and pulls out. He pushes the control knob in to shut off the CO 2 ground sweep.

To discharge the foam from the ground sweep, he places his right hand on the ground sweep discharge control knob and pulls out. He pushes the control knob in to shut off the foam ground sweep.

(3) The CREW CHIEF rides on the running board of the right side of the truck next to the door. He is in active charge of the crew and the truck.

(4) The RIGHT CO 2 PLAYPIPE HANDLINEMAN rides on the right side of the truck on the running board behind the hose reel. He operates the right CO 2 playpipe.

He lifts the handle of the playpipe release mechanism and moves it slightly past the latch. He grasps the playpipe with his left hand half way between the valve and the nozzle and lifts the nozzle, placing the back end of the playpipe across the right thigh. He opens the valve by a forceful downward motion with the palm of his right hand. Holding the playpipe valve lever firmly against the playpipe handle, he will hold the playpipe valve wide open, as it should always be when discharging carbon dioxide. The playpipe is held at approximately a 25-degree angle.

He replaces the hose and playpipe on the truck, turns the hose reel by hand to roll the hose on the reel, and replaces the nozzle on the truck running board so that the playpipe rests in the playpipe mechanism handle to its normal closed position.

To operate the right bayonet nozzle and hose line, he removes the bayonet nozzle from the truck, first pulling the latch pin from the fastening bracket, tips the bayonet nozzle away from the truck so that it opens the latch and clears the fastening bracket, lifts the bayonet nozzle from the truck, and pulls the hose free from the fastening clip.

To start the discharge, he turns the pilot valve so that the indicator points to the word OPEN.

The hose may be removed from the hose basket in which it is carried by putting the left arm down through the coiled loops and pulling it out of the basket, letting the hose feed out of the arm while progressing to the point of the operation, then drops the entire coil of the hose.

To stop the discharge, he turns the pilot valve control knob so that the indicator points to the word CLOSED. He replaces the hose and the bayonet nozzle on the truck by carefully coiling the hose in a figure "8" back into the basket where it will lay flat, and replaces the bayonet nozzle and hose into its fastening bracket.

(5) The FOAM RIGHT HANDLINE-MAN rides on the right side of the platform at the rear of the truck.

His first operation is to pull off all the CO 2 hose on the reel for the right hand CO 2 playpipe handlineman. He returns to the rear of the foam hose basket and turns on the foam hose pilot valve. He grasps the foam nozzle in his right hand, placing his left heel in the side step with his back to the truck. He places his left arm through the coil of hose and lifts the hose from the basket, letting the hose feed out of the arm until the point of operation is reached. He drops the remaining coils of hose, placing both hands on the foam nozzle.

He turns on the foam discharge by pressing forward on the bottom lever of the gun body. A straight stream discharge can be turned on by pressing forward the top lever on the gun body.

To stop the discharge, he pulls back both levers.

When the operation with the foam hose is completed he turns off the foam hose pilot valve, opens the gun to remove the pressure from the hose, then recoils the hose into the basket in a figure "8", making sure the hose is laying flat in the basket.

The operation procedures for the left handlinemen are the same as the right handlinemen except the hose lines will be on their left side instead of their right.

m. EVALUATION (Self).

- (1) How many feet of hose are there on the following?
 - (a) CO 2 playpipe.
 - (b) CO 2 bayonet nozzle.
 - (c) Foam nozzle.
- (2) How is the top boom raised?
- (3) How do you discharge CO 2 from the top boom?
- (4) How do you discharge foam from the radiator nozzle?
- (5) What is the exact position of the panel operator?
- (6) Which of the ground sweep control knobs do you operate for CO 2?

n. Read TO 19-25A-3, paragraph 28, pages 19, 20, 21, 22, and 23, Filling the Foam Solution Tank and Filling the Carbon Dioxide Tank.

o. EVALUATION (Self).

- (1) Where do you connect the hose to fill the foam tank?
- (2) What is done about the pressure when preparing to fill the foam tank?
- (3) What is the diameter of the pipe at the intake of the foam tank?
- (4) How is the pressure released prior to filling the foam tank?

- (5) How do you apply pressure in the foam tank?
- (6) What is the 1½-inch line called which is used to fill the CO 2 tank?
- (7) What is the one-inch line called which is used to fill the CO 2 tank?
- (8) How can you determine when the CO 2 tank is filled if the gauges are broken?
- (9) What should you do in case the CO 2 tank is over-filled?
- (10) What malfunction occurs if the CO 2 tank is over-filled?

p. Your Instructor will demonstrate the filling of the CO 2 and the foam tanks as outlined.

5. PRACTICAL PROCEDURE.

a. You will be assigned to a crew of 7 men on the Class 150 Crash Truck by your Instructor, and your position will be designated. You will rotate until you have performed the duties of each crew member.

b. You will assist in charging the CO 2 tank from the storage unit and charging the foam tank.

c. Your Instructor will designate the area for the operation and the distance to be traveled for each operation.

d. You will perform the duties of:

- (1) Crew chief.
- (2) Driver.
- (3) Panel operator (CO 2 or foam will not be used unless so ordered by your Instructor. You will simulate when CO 2 and foam are not to be used).
- (4) CO 2 playpipemen (You will not use CO 2 unless so ordered by your Instructor. You will simulate when CO 2 is not to be used).
- (5) Foam handlinemen (You will not use foam unless so ordered by your Instructor. You will simulate when foam is not to be used).

1. You will be informed by your Instructor

when to operate the CO 2 bayonet nozzle (You will not use CO 2 unless so ordered by your Instructor. You will simulate when CO 2 is not to be used).

e. You will assist in performing inspection and maintenance of the Class 150 Crash Truck using form 42 and TO 19-25A-3.

f. EVALUATION (Self).

- (1) Who removes the remaining CO 2 hose line from the truck for the playpipe handlinemen?
- (2) Where does the crew chief ride on the Class 150 Crash Truck?
- (3) On what side of the handlines do the handlinemen stand?
- (4) Who operates the top boom, radiator nozzle, and ground sweep?
- (5) How many men make up a crew on the Class 150 Crash Truck?
- (6) Give the location and duties of each position on the Class 150 Crash Truck?
- (7) How do you open the valve on the playpipe?
- (8) How do you stop the discharge of CO 2 from the bayonet nozzle?
- (9) What is the procedure for replacing the foam line in the basket on the Class 150 Crash Truck?
- (10) How do you charge the foam handline?
- (11) What procedure is used in placing the bayonet nozzle handline in the basket on the Class 150 Crash Truck?
- (12) How do you charge the playpipe handline with CO 2 on the Class 150 Crash Truck?

6. CRITIQUE.

a. Your Instructor will conduct a critique of this training project and summarize the following key points:

- (1) Crew positions and duties on the Class 150 Crash Truck.
- (2) The capacity of the CO 2 tank.

- (3) The capacity of the foam tank on the Reo and the Sterling.
- (4) The discharge capacity of each CO 2 and foam outlet.
- (5) Inspection and preventive maintenance on the Class 150 Crash Truck.

b. You will assist in performing "driver's" maintenance on the truck, and equipment including washing and polishing.

7. GRADING POINTS.

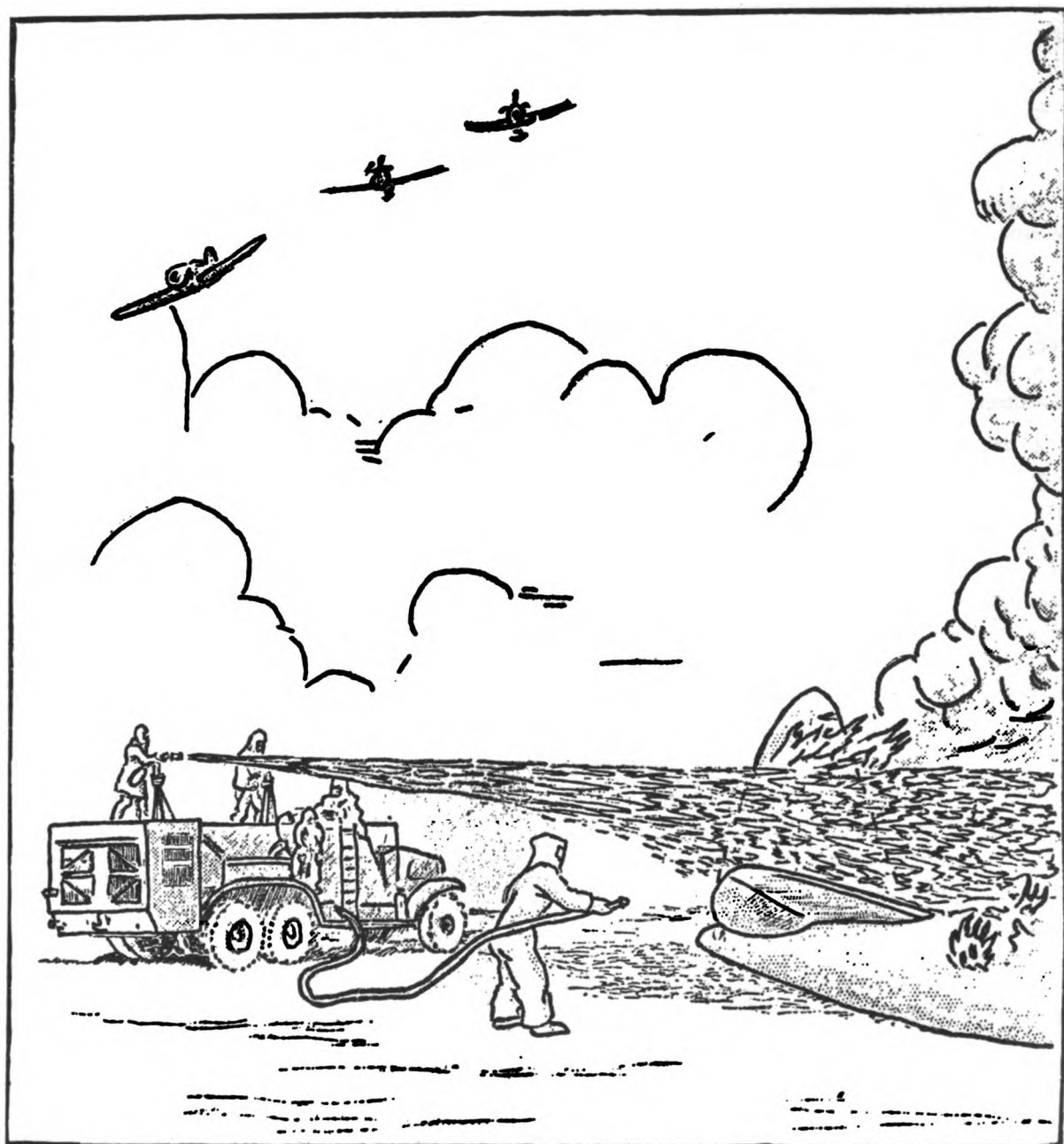
Grading points	Above average + 1	Average 0	Below average - 1
1. Did the driver start the truck in first gear?			
2. Did the driver position the Class 150 Crash Truck head-on?			
3. Did the driver start and stop the truck smoothly?			
4. Did the driver set the hand brake before leaving the truck?			
5. Did the panel operator raise the boom before swinging it around?			
6. Did the panel operator pull the trigger when told to discharge CO 2 from the boom?			
7. Did the panel operator put both hands on the pistol controls when told to take his position?			
8. Did the crew chief ride on the right side of the truck?			
9. Did the crew chief wait until the truck stopped before stepping-off the truck?			
10. Did the CO 2 playpipe-man position himself on the inside of the nozzle?			

Grading points	Above average + 1	Average 0	Below average - 1
11. Did the foam playpipe- man position himself on the inside of the nozzle?			
12. Did the CO 2 playpipe- man hold the nozzle at a downward angle?			
13. Did the CO 2 playpipe- man position himself properly at the point of operation?			
14. Did the foam lineman pull the CO 2 line from the hose reel be- fore assuming his position with the foam nozzle?			
15. Did the foam lineman carry the hose coils to the point of opera- tion?			
16. Did the foam lineman charge the foam line before leaving the truck?			
17. Did the student per- form the recharging of the CO 2 tank properly?			
18. Did the student fill the foam tank properly? Was the CO 2 pres- sure applied?			
19. Did the student per- form drivers mainte- nance by washing and polishing the truck and equipment?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH

CLASS 155 CRASH TRUCK



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

- a. The identification and the nomenclature of the Class 155 Crash Truck.
- b. The operation (including individual duties of crew members) of the Class 155 Crash Truck.
- c. Inspection and maintenance procedures of the class 155 Crash Truck.

2. REFERENCE.

TO 19-25A-32, Operation, Service, and Overhaul Instructions for Crash Truck Class 155.

Form 42, Inspection and Preventive Maintenance Roster.

3. EQUIPMENT.

- a. One Class 155 Crash Truck fully equipped.
- b. AF Form 42, Inspection and Preventive Maintenance Record.

4. INFORMATIONAL PROCEDURE.

Read TO 19-25A-32, sections 1 and 2, pages 1, 2, 3, and 4, for identification of the Class 155 Crash Truck. This truck makes a head-on approach and positions at a-near-diagonal. The turrets will operate on each side of aircraft starting from the fuselage and working outward to control and/or extinguish the fire.

EVALUATION (Self).

- (1) Upon what type chassis is the Class 155 Crash Truck mounted?
- (2) What is the maximum pump capacity of the Class 155 Crash Truck at 600 p.s.i.?
- (3) What type of pump is mounted on the Class 155 Crash Truck?
- (4) How is power transmitted to the pump on the Class 155 Crash Truck?
- (5) How many handlines are on the Class 155 Crash Truck?

Read TO 19-25A-32, section VI, pages 10, 11, 12, and 13, for operational procedure on the Class 155 Crash Truck.

EVALUATION (Self).

- (1) What precaution is taken before starting the pumping unit?
- (2) Where are the shut-off valves for the side hose lines located?
- (3) Where is the valve for the forward or tunnel line located?
- (4) Where is the tank valve handle located?
- (5) In what position is the valve on the tank when the handle is pulled up?
- (6) What is the purpose of the agitator valve?
- (7) Where are the pumping engine controls located?
- (8) Where are the pumping engine throttles located?

You will accompany your Instructor for a visual identification of the Class 155 Crash Truck, including equipment, appliances, and crew positions, by starting from the left front of the truck and progressing clockwise.

The individual crew positions and duties are as follows:

The CREW CHIEF rides in the cab on the right side and is in charge of the crew. His duties are to start the rear engine and accelerator to obtain the desired pump pressure when approaching if it has not been accomplished by the front turretman. He signals to the turret operators when to initiate operation of the turrets, and he acts as a lookout for the driver. At the scene of the aircraft emergency, the first vehicle to arrive establishes the nucleus of the operation and takes charge of the rescuemen and the handlinemen.

The DRIVER rides in the cab on the left side. His duties are to start the truck in first gear, shift to higher gear by double clutching, selecting the shortest and best route to the emergency, operate the front wheel drive and low range levers, and be on the lookout for personnel and objects in the path of the truck. He makes a head-on approach and positions on-a-near diagonal. While in posi-

tion at the crash, he controls the pump pressure from the cab, remains on the truck, and keeps alert for any signal from the crew chief.

The RESCUEMAN rides on the right side of the truck on the running board immediately behind the cab. He removes the crash kit, carries it to the point of operation and unrolls it. He assists in the rescue of personnel.

The RIGHT HANDLINEMAN rides just in front of the hose basket, holding the handrail with his left hand with his right arm through the hose coil. Preparatory to alighting from the truck, he assumes a sitting position, opens the shut-off valve, and alights from the truck, removing all of the hose from the hose basket. The handlineman will use the handline on the side nearest the fire. Other handlinemen will come around the rear of the truck and use the tunnel line. The hose is racked in the basket in a figure "8" coil.

The LEFT HANDLINEMAN rides just in front of the hose basket, right hand holding the handrail, and the left arm through the hose line. Preparatory to alighting from the truck, he assumes a sitting position, opens the shut-off valve, and alights from the truck, removing all the hose from the hose basket.

The determining factors which control handlines to be used are:

a. The handlineman nearest the fire uses the side handline.

b. The opposite handlineman proceeds around the rear of the truck and uses the tunnel line.

The tunnel handlineman removes all of the line from the basket before opening the discharge valve.

The FRONT TURRET OPERATOR rides on the turret deck, starts the rear engine and adjusts it to the desired pressure. He immediately fastens his safety belt and places both hands on the control handle when preparing to open the nozzle. He opens the nozzle when the truck comes within range of the crashed aircraft and/or upon signal from crew chief.

The REAR TURRET OPERATOR rides on the turret deck, with his safety belt fastened, and opens the turret nozzle when the truck starts to turn for position and/or upon signal from the crew chief. The turret operators will keep their hands on the discharge controls and be alert at all times.

EVALUATION (Self).

- (1) What position does this type of crash truck assume at an aircraft emergency?
- (2) Where does the crew chief ride, and what are his duties?
- (3) How many men are required for a crew on the Class 155 Crash Truck?
- (4) Where does the rescueman ride and what are his duties?
- (5) Which of the crew members operates the tunnel line?
- (6) When does the front turret operator open his turret?
- (7) When does the rear turret operator open his turret?
- (8) Which crew member operates the pumping controls after the truck is positioned at an aircraft emergency?

Your Instructor will demonstrate, with your assistance, the positions of each crew member and his duties on the Class 155 Crash Truck.

5. PRACTICAL PROCEDURE.

Your instructor will assign you to a crew of seven men and your position will be designated.

You will assist in filling the tank on the Class 155 Crash Truck.

Your Instructor will designate the area for the operation and the distance to be traveled for each operation. You will rotate on each position until you have performed the duties of:

- (1) Crew chief.
- (2) Driver.
- (3) Rescueman.

- (4) Right handlineman.
- (5) Left handlineman.
- (6) Front turretman.
- (7) Rear turretman.

You will assist in performing inspection and maintenance of the Class 155 Crash Truck using AF Form 42.

EVALUATION (Self).

- (1) What is the discharge capacity of the pump at 600 p.s.i.?
- (2) What type of pump is utilized on the Class 155 Crash Truck?
- (3) Where are the pump controls located?
- (4) How many turrets and handlines are on the Class 155 Crash Truck?
- (5) What is the length of each handline?
- (6) Where are the handlines located?
- (7) Who is responsible for starting the rear engine and accelerating to the desired pump pressure?
- (8) Which handlines are initially used at a crash fire?

6. CRITIQUE.

The Instructor will conduct a critique of this training project and will summarize the following key points:

- (1) The position of the 155 Crash Truck at aircraft emergency.
- (2) The number of crewmen, their positions and duties.
- (3) The number of handlines.
- (4) The auxiliary equipment.

- (5) The capacity of the booster tank and the pump.
- (6) The range of the Turrets.

You will assist in performing "driver's" maintenance on the truck and equipment, including washing and polishing.

7. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the crew chief perform his duties properly at the operation?			
2. Did the driver start in the proper gear?			
3. Was the student properly clothed before and during the operation?			
4. Did the student take his proper position?			
5. Did the driver handle the truck properly when approaching and positioning?			
6. Did the driver position the truck properly at the scene of operation?			
7. Did the student load the hose properly?			
8. Did the student take the proper position at the scene of operation?			
9. Did the pump operator maintain the proper pressure?			
10. Did the rescueman carry out his assignments as instructed?			

**HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO**

**DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH**

**INTRODUCTION TO RESCUE OF ENTRAPPED PERSONNEL
PART I**



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

The visual identification and the nomenclature of military type aircraft.

The construction features and the forcible entry points.

The location of the air crew members and the procedures for release and removal, including the administration of first aid.

The location and hazard of armament.

2. REFERENCE.

AF Manual 64-25, Aircraft Crash Rescue.

3. EQUIPMENT.

One Class 125 Crash Truck fully equipped.

Two dummies, including parachute harness and safety belts.

Available current standard aircraft.

4. INFORMATIONAL PROCEDURE.

Read the following information and study the diagrams:

The knowledge of the location of personnel in different type aircraft and the methods of gaining forcible entry when hatches, doors, and canopies are jammed is of paramount importance to the crash rescuer. Without this valuable information, the technique of fire control is of no avail. Your primary objective is to save life and the secondary objective to save property.

The knowledge of forcible entry points and crew location is a sure avenue to successful rescue operations. You should know the precautions to take in regard to the different types of aircraft such as fighters with their guns, rockets, bombs, and ejection seats, bombers with their bombs and guns, and cargo transports with sick personnel aboard.

For all of these and other reasons, you, the crash rescuer, should know as much as possible about all types of military aircraft and their crews.

The T-6 is a trainer-type aircraft. It is designed to carry two men, one in the front section of the cockpit and one in the rear section. The T-6 has a radial engine, and a

gasoline capacity of 110 gallons. The gasoline is carried in the wing tanks, one in either wing with an equal capacity of 55 gallons. There is a 10-gallon oil tank located in the accessory section and mounted on the fire wall. The battery is located in the accessory section immediately aft the engine on the righthand side. Forcible entry is accomplished through the front and/or rear section of the canopy. The external release for the front section is on the left forward side of the canopy, and the rear canopy release is on the left side of the rear canopy. See diagram number 1 of the T-6.

The F-51 is a fighter-type aircraft. The pilot is the only member of the crew. It has an inline engine and a gasoline capacity of approximately 269 gallons, 92 gallons in each wing, and 85 gallons in the fuselage tank. The gasoline tanks are located in the wing sections, one in either wing, and the fuselage tank is located immediately aft the cockpit. The battery is located behind the pilot's compartment. The armament consists of three fixed .50 caliber machine guns mounted in each wing.

Forcible entry is accomplished through the canopy. See diagram number 2 of the F-51.

The F-86 is a fighter-type aircraft. The pilot is the only member of the crew. It has a jet engine and a fuel capacity of approximately 843 gallons. The fuel tanks are mounted in the wing sections except for the drop tanks which are mounted on the wing tips. The battery is located in the nose section. Forcible entry is made through the canopy. The external emergency canopy release can be reached through the accessory door on the left side of the fuselage below the canopy frame. This canopy release does not pull the safety pin on the ejector seat handle. The F-86 has six fixed guns mounted three on either side of the nose section. See diagram number 3 of the F-86.

The H-5 helicopter has a crew capacity of three men who are located in the main fuselage section. The engine is located in the rear section of the main fuselage section.

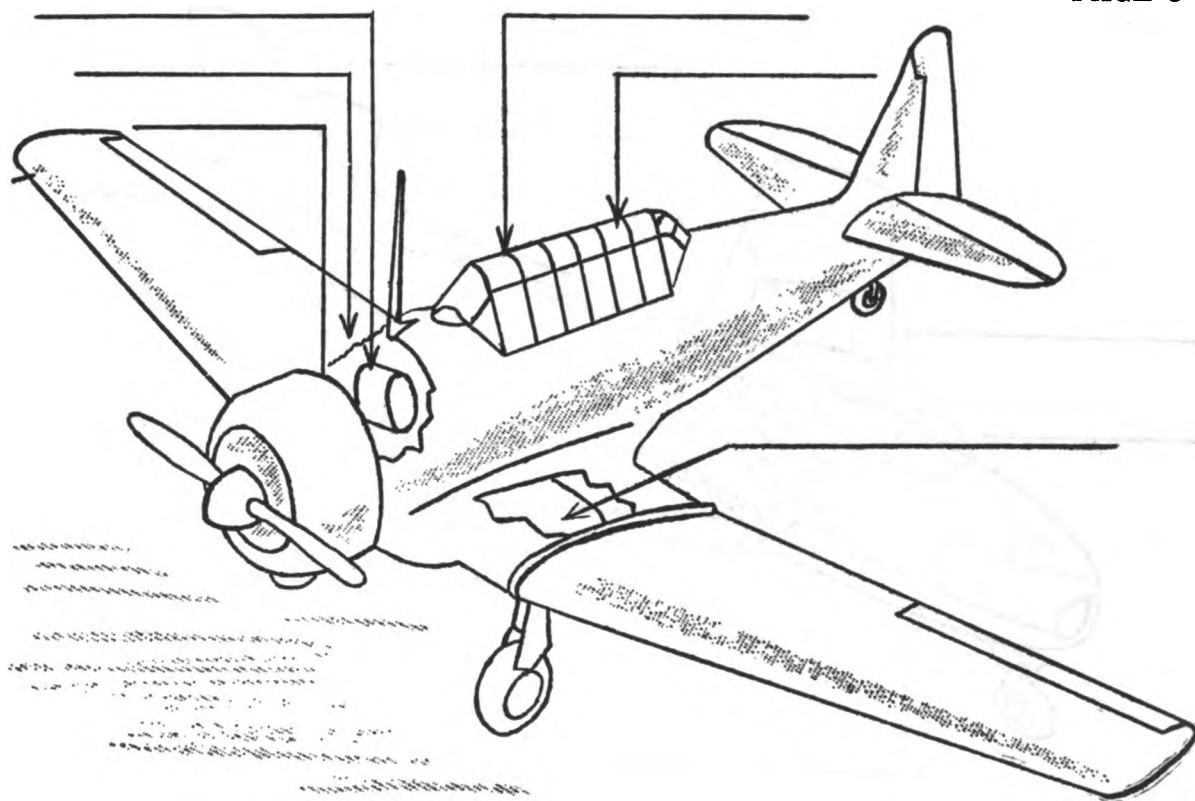


Figure 1. T-6.

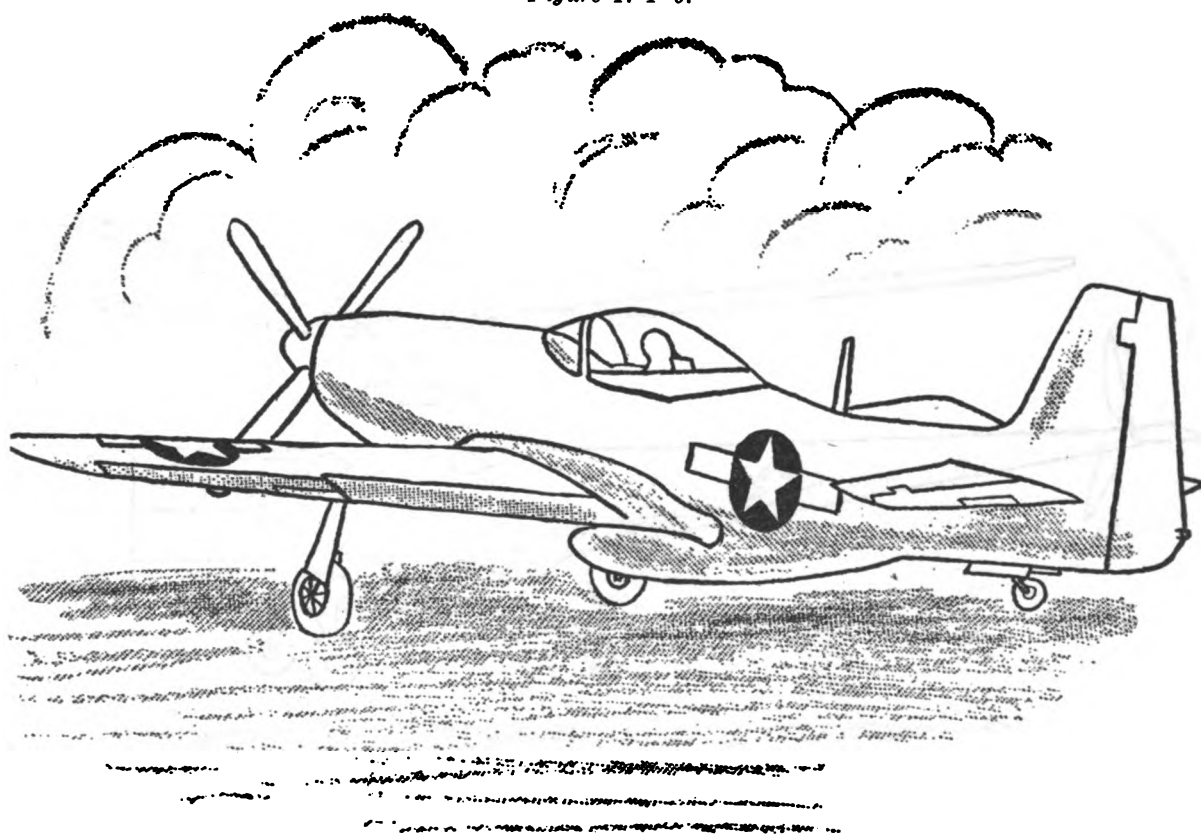


Figure 2. F-51.

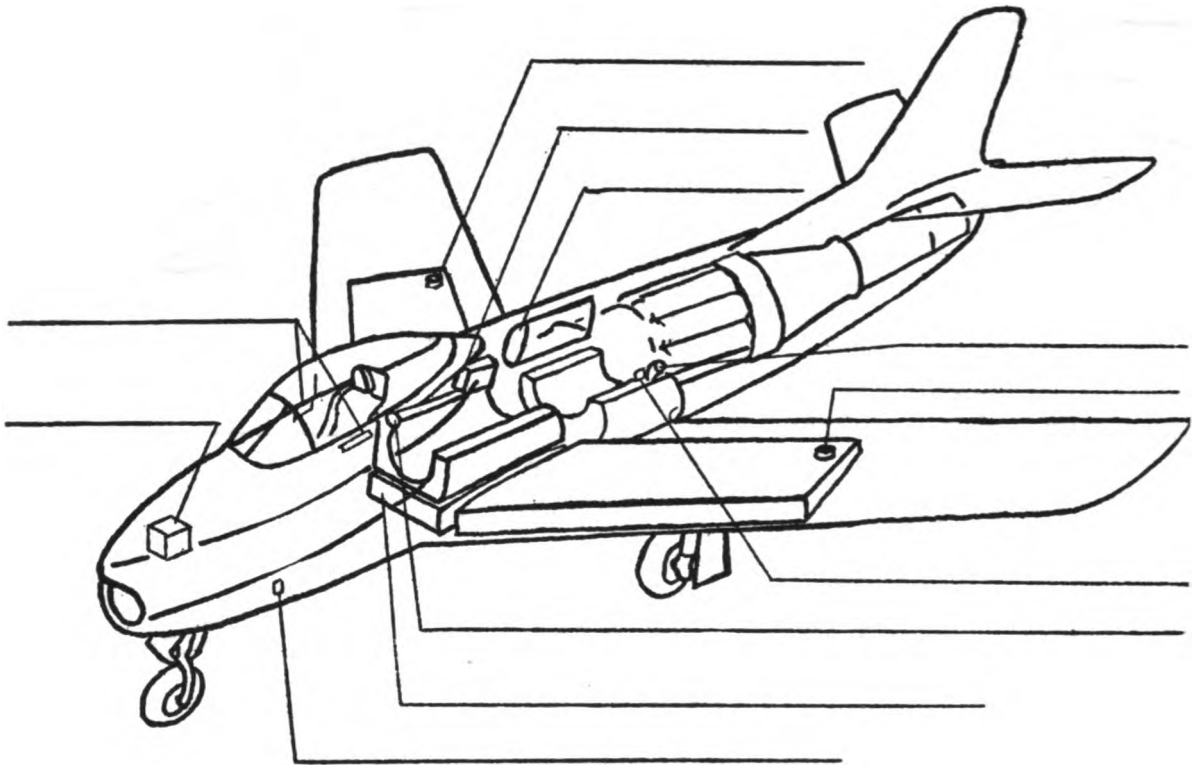


Figure 3. F-86.

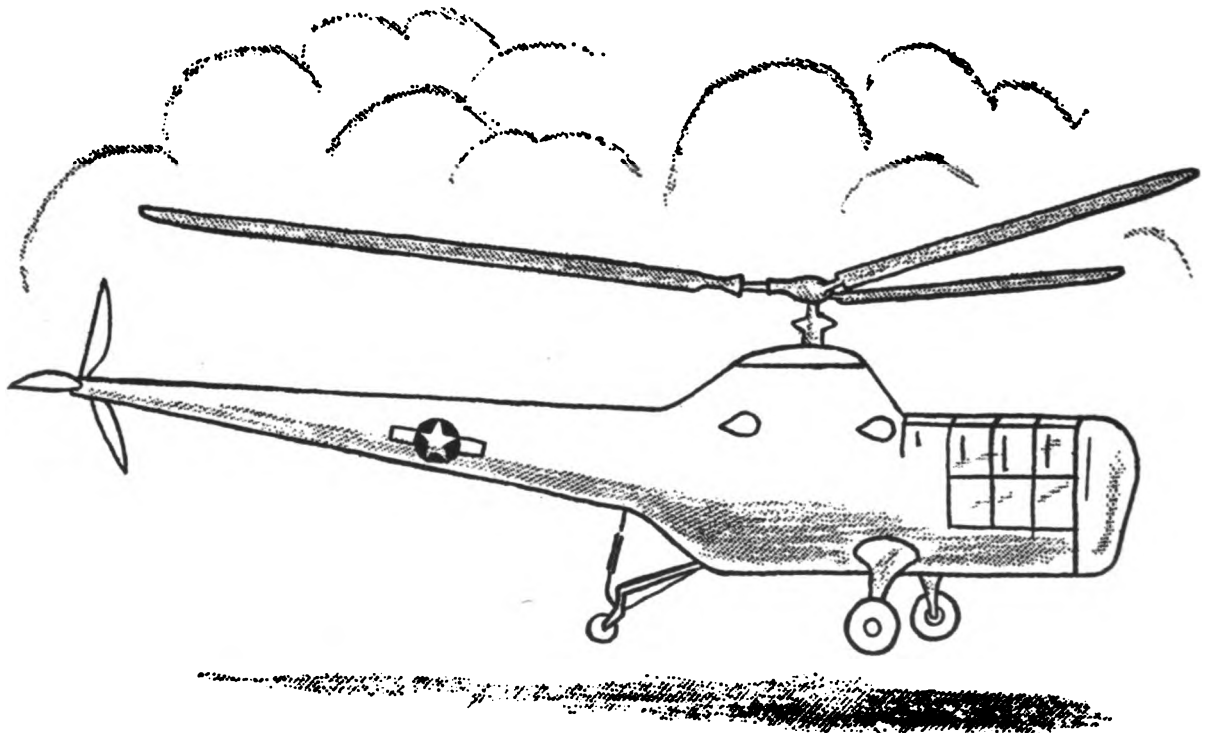


Figure 4. H-5.

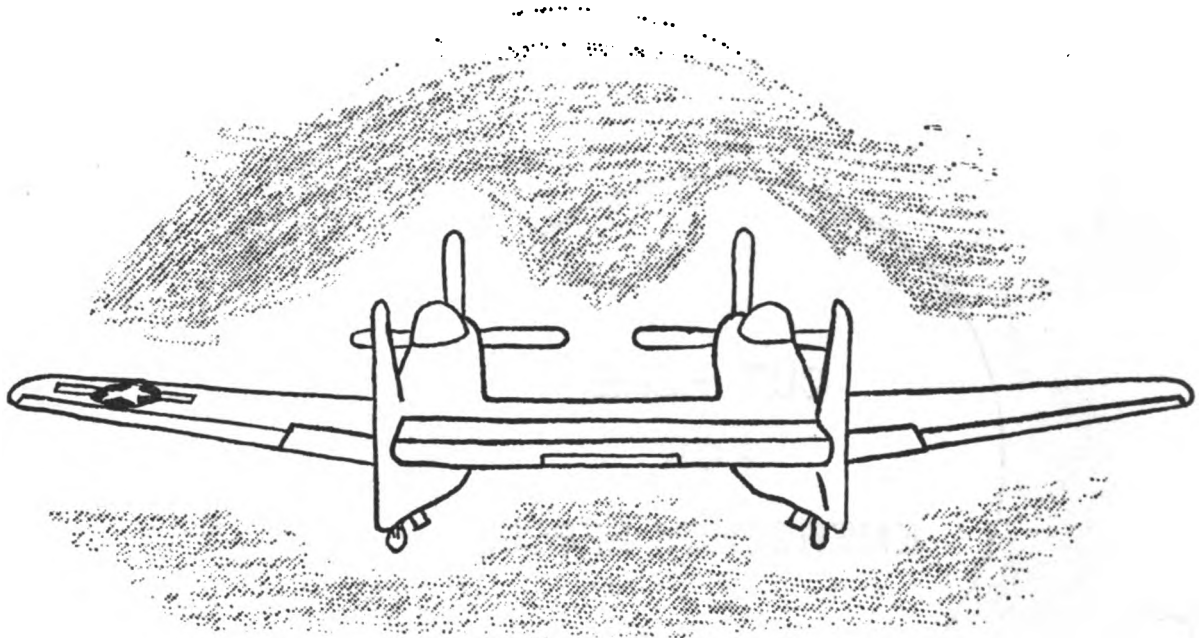


Figure 5. F-82.

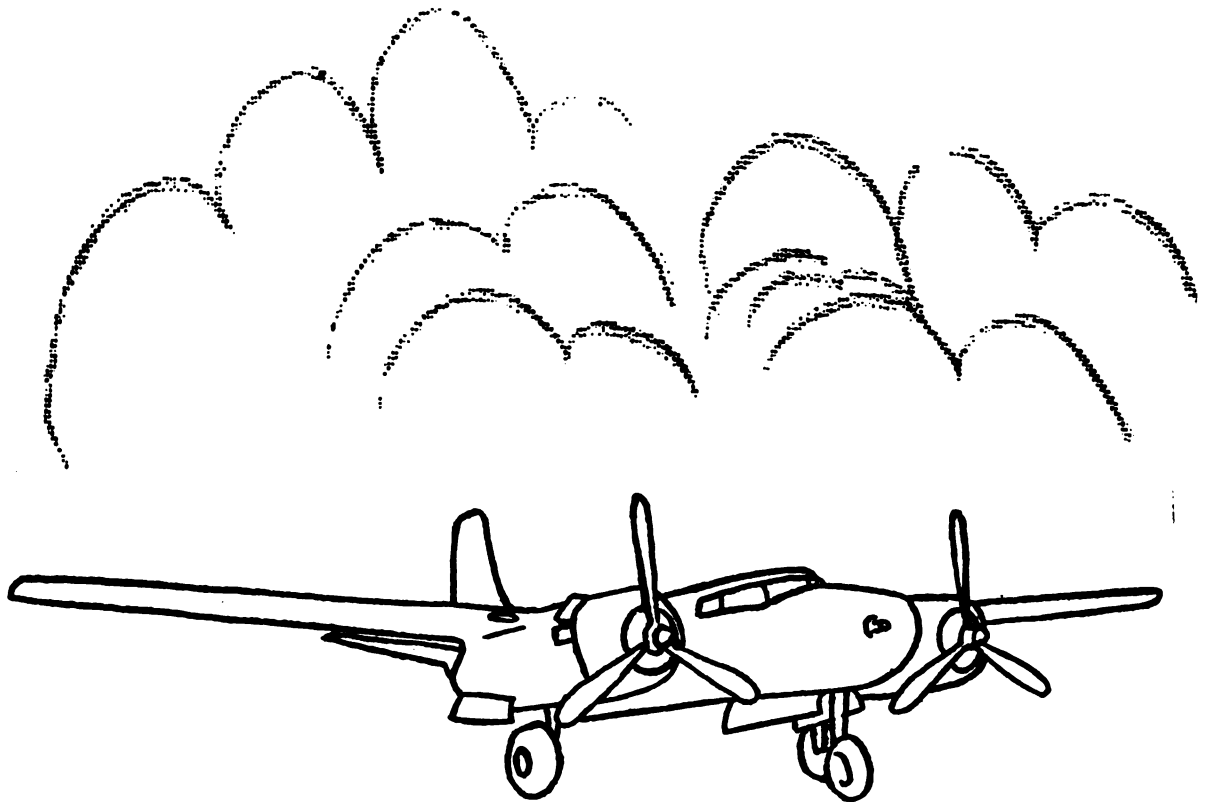


Figure 6. B-26.

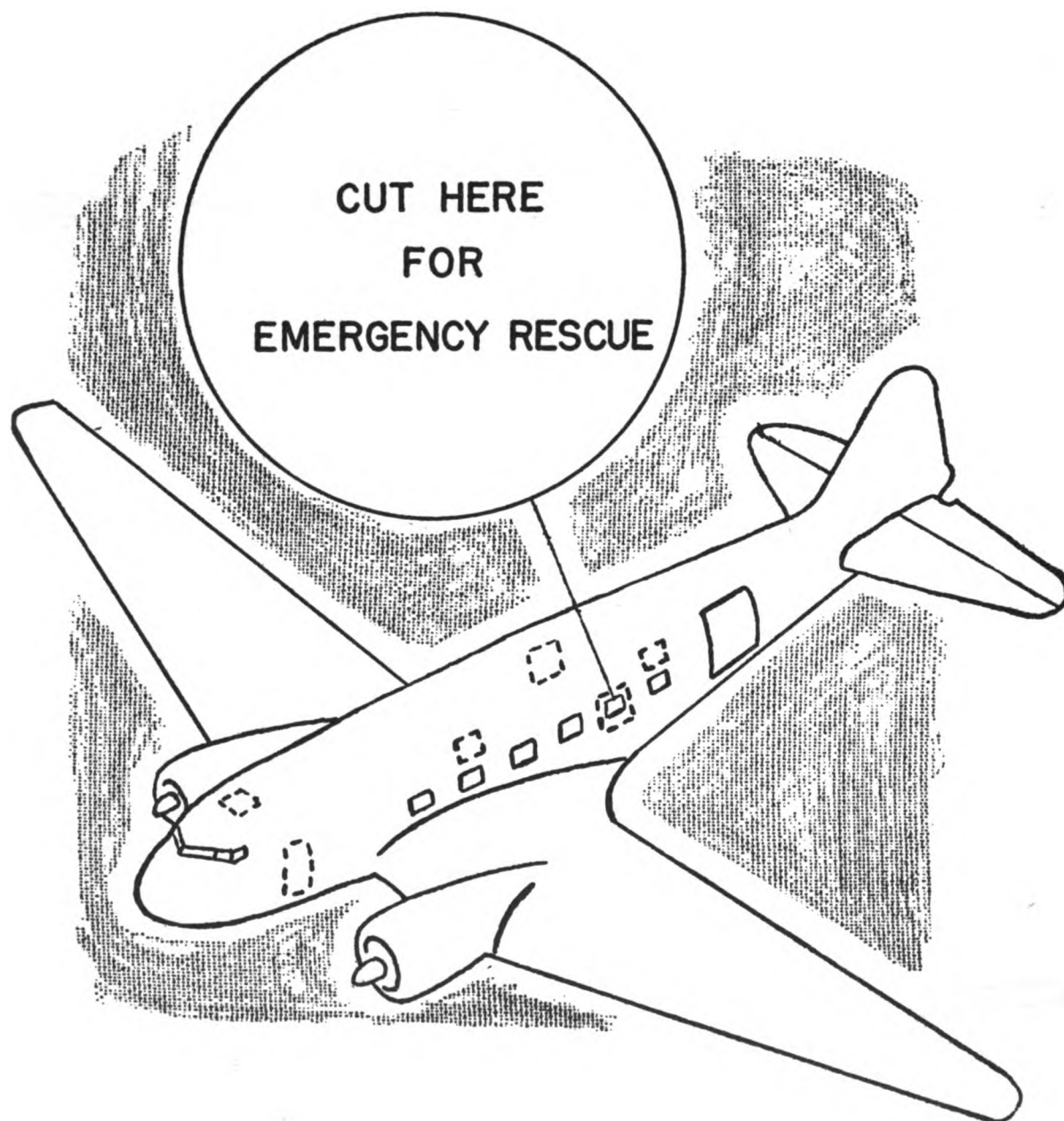


Figure 7. C-47.

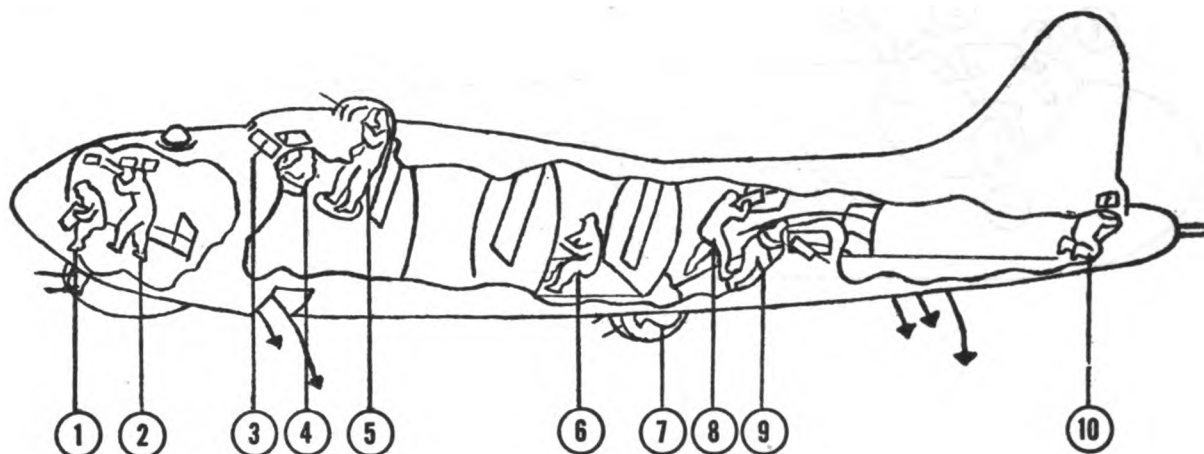


Figure 8. B-17.

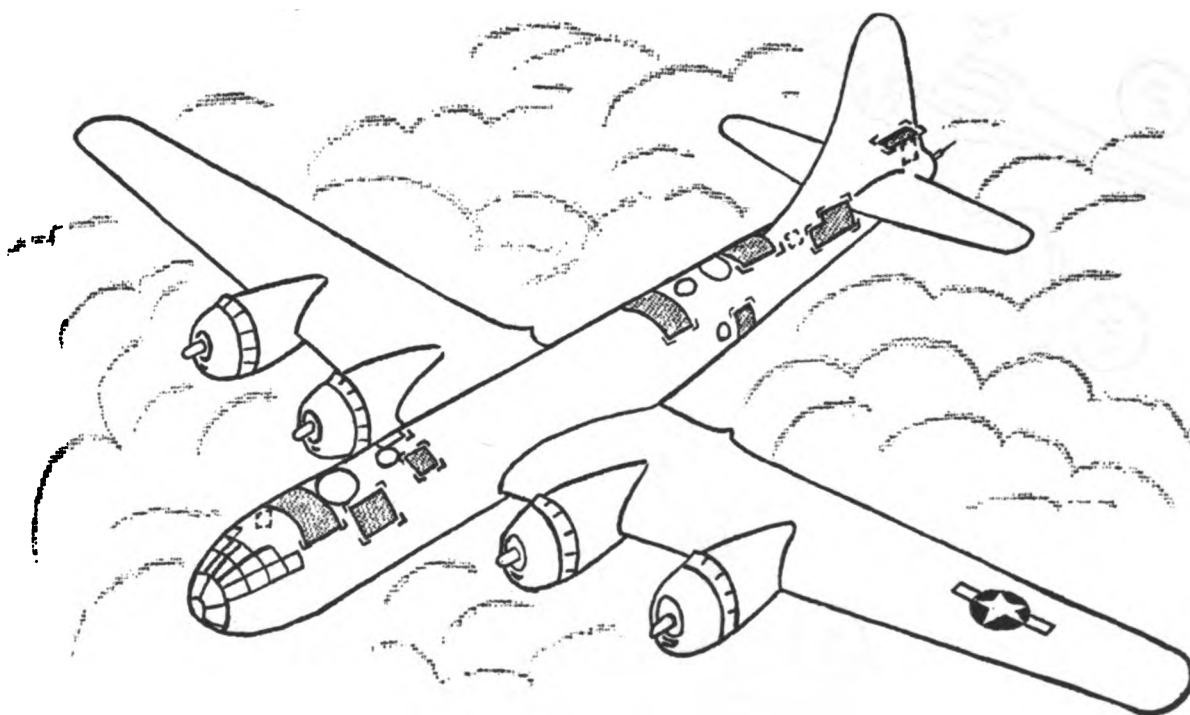


Figure 9. B-29.

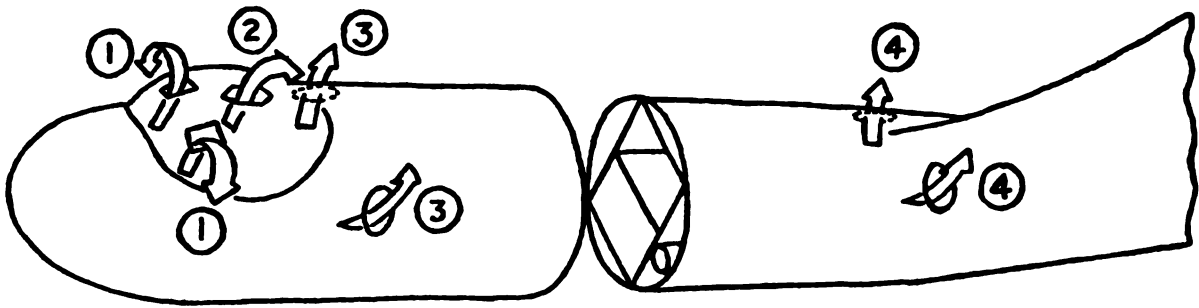


Figure 10. B-36.

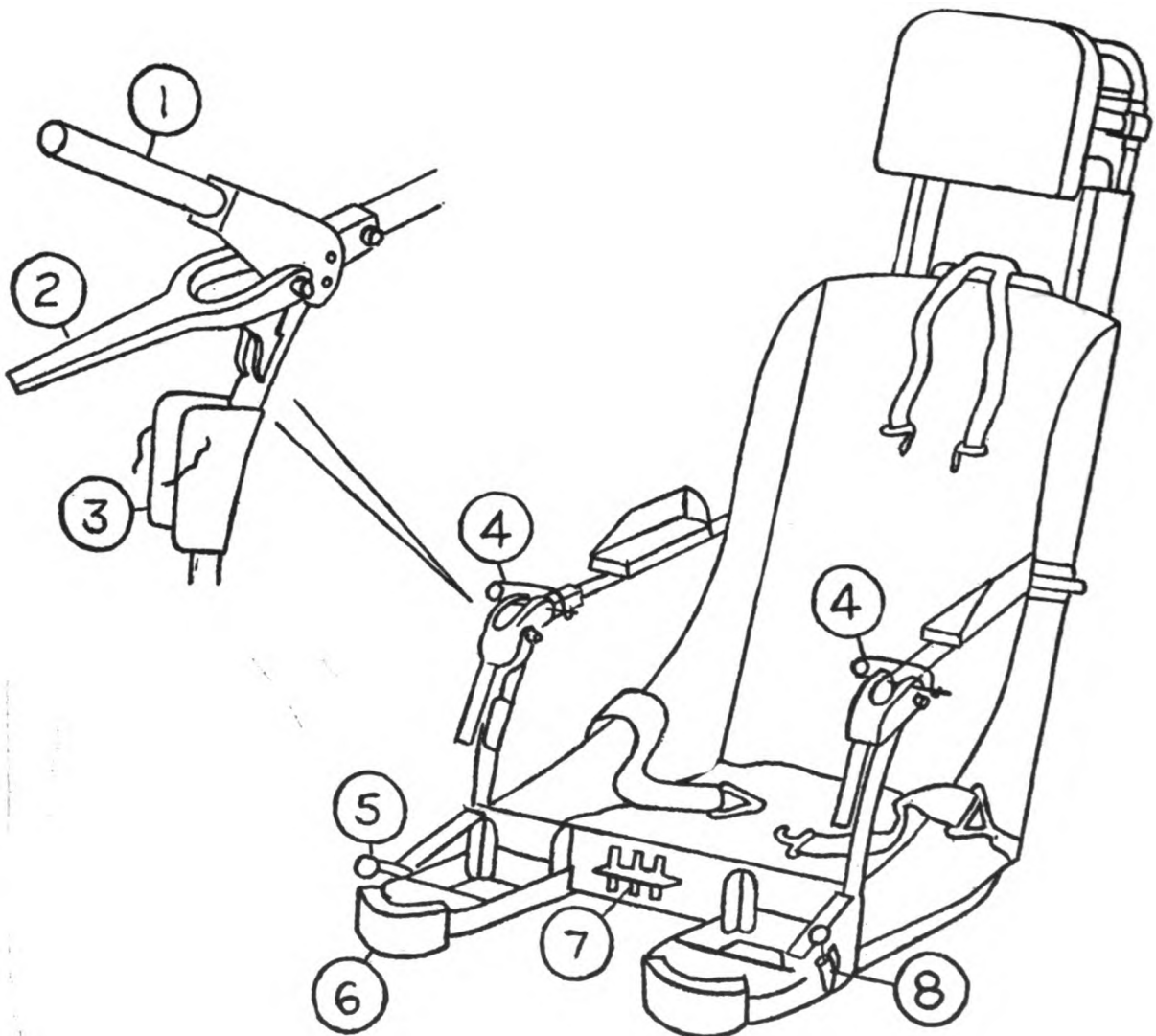


Figure 11. Ejection Seat.

The fuel capacity is approximately 100 gallons. The fuel tanks are located one forward and one aft the engine section. Forcible entry is made through the canopy. The normal exits are on the right side. See diagram number 4 of the H-5.

The F-82 is a fighter-type aircraft with a crew of two, one in either fuselage. The F-82 has two inline engines, one on either fuselage. The fuel capacity is approximately 910 gallons. The fuel tanks are located in the outer wing sections and also in the section between the fuselages. The battery is located in the left radio compartment. The armament consists of six .50 caliber machine guns mounted in the center wing section. Forcible entry is accomplished through the canopies. See diagrams number 5 of the F-82.

The B-26 has a crew of three. They are located in the main fuselage section. The B-26 has two radial engines, and the gasoline capacity is 925 gallons. The fuel tanks are located in the wing sections. The battery is located in the nose wheel weld. The B-26 is armed with twelve .50 caliber machine guns which are mounted in the nose and in the top and belly turrets. The escape hatches are located over the pilot's compartment and the gunner's compartment. See diagram number 6 of the B-26.

The C-47 is a cargo-type aircraft with a crew of 3 to 5 men located in the nose section and the radio section. When used as a transport, it will carry 27 passengers who are located in the fuselage section. The C-47 has two radial engines and a fuel capacity of 804 gallons. The fuel tanks are located within the wing sections. There are two tanks in each wing. The C-47 batteries are located in the nose section and under the center of the cockpit. The normal exits are located on the left side, one being the main fuselage door at the left rear of the fuselage, and the pilot's escape door on the left side of the pilot's compartment. See diagram number 7 of the C-47.

The B-17 is a bomber-type aircraft with

a crew capacity of 10 men, 5 forward and 5 aft the wing section. The B-17 has four radial engines with a fuel capacity of approximately 2,780 gallons. The fuel tanks are located in the wing sections. There are three 24-volt batteries in the loading edge of the wing adjacent to the fuselage. Two of the batteries are on the right and one is on the left side. The armament consists of a chin turret, ball turret, and a top turret, each mount having two .50 caliber machine guns. There are two .50 caliber machine guns in the waist compartment, two in the nose compartment, and two in the tail. The main entrance door is on the right side of the fuselage aft the wing. Below the pilot's compartment is an escape hatch. See diagram number 8 of the B-17.

The B-29 is a bomber and carries a crew of 11 men, 6 forward and 5 aft the wing section. The B-29 is powered with 4 radial engines and has a fuel capacity of 9,548 gallons. The fuel tanks are located in the wing section. The battery is located to the left of the main entrance door aft the wing section on the right side of the fuselage. The armament consists of two .50 caliber machine guns in each of the following turrets: upper and lower forward, upper and lower rear, and tail. Forcible entry is made through the right rear door, engineer's hatch, and copilot's hatch in the forward section of the cockpit. See diagram number 9 of the B-29.

The B-36 is a bomber-type aircraft and requires a crew of 14 men, 9 forward and 5 aft the wing section. The B-36 has six pusher-type engines and a gasoline capacity of approximately 21,050 gallons. The fuel tanks are located in the wing sections. The battery is located just aft the food locker on the left side of the fuselage section. Armament on the B-36 consists of 8 remotely-controlled turrets containing two 20 millimeter guns each. There are seven ground exits, five forward, and two aft the wing section. See diagram number 10 of the B-36.

For identification of aircraft construction, read Section X of AF Manual 64-25.

EVALUATION (Self).

- (1) What is the fuel capacity of the T-6 aircraft?
- (2) Where is the battery located on the T-6?
- (3) Where is forcible entry accomplished on the T-6?
- (4) Where are the external releases for the canopy on the T-6?
- (5) What type engine is mounted in the F-51?
- (6) What is the fuel capacity of the F-51?
- (7) Where is the battery located on the F-51?
- (8) How many fixed guns are mounted on the F-51? Where are they located?
- (9) Where is forcible entry accomplished on the F-51?
- (10) What is the fuel capacity of the F-86?
- (11) Where is the battery located on the F-86?
- (12) How many fixed guns are mounted on the F-86? Where are they located?
- (13) Where is the external canopy release located on the F-86?
- (14) Where is the trigger lever for the jettison seat mechanism located on the F-86?
- (15) How many fixed guns are mounted on the F-86? Where are they located?
- (16) How many men are there on the crew of a helicopter?
- (17) Where are the crew positions on the helicopter?
- (18) Where is the engine located on the helicopter?
- (19) What is the fuel capacity of the helicopter? Where are the fuel tanks located?
- (20) Where are the normal exits located on the helicopter?
- (21) How many men are there on the crew of an F-82?
- (22) Where are the crew locations on the F-82?
- (23) What is the fuel capacity of the F-82?
- (24) Where are the fuel tanks located on the F-82?
- (25) Where is the battery located on the F-82?
- (26) What is the number of fixed guns on the F-82? Where are they located?
- (27) Where is forcible entry accomplished on the F-82?
- (28) The crew of a B-26 is composed of how many men?
- (29) What is the fuel capacity of the B-26?
- (30) Where is the battery located on the B-26?
- (31) How many guns are mounted on the B-26? Where are they located?
- (32) Where are the escape hatches located on the B-26?
- (33) How many men are there on the crew of a C-47?
- (34) How many passengers will the C-47 carry?
- (35) What is the fuel capacity of the C-47?
- (36) Where are the batteries located on the C-47?
- (37) Where are the normal exits located on the C-47?
- (38) How many forcible entry points are there on the C-47?
- (39) How many men are there on the crew of a B-17?
- (40) Where is the crew located on a B-17?
- (41) What is the fuel capacity of the B-17?
- (42) How many batteries are there on the B-17? Where are they located?

- (43) What is the amount of armament on the B-17? Where is it located?
- (44) Where are the main exit doors on the B-17?
- (45) How many men are there on the crew of a B-29?
- (46) Where is the crew located on the B-29?
- (47) What is the fuel capacity of the B-29?
- (48) How many batteries are there on the B-29? Where are they located?
- (49) What is the amount of armament on the B-29? Where is it located?
- (50) Where are the forcible entry points on the B-29?
- (51) What is the normal number of crewmen on the B-36?
- (52) Where is the crew located on the B-36?
- (53) What is the approximate amount of fuel carried on the B-36?
- (54) How many batteries are there on the B-36? Where are they carried?
- (55) What is the amount of armament on the B-36? Where is it located?
- (56) How many ground exits are there on the B-36?
- (57) How can the materials used in aircraft construction aid in crash rescue?
- (58) What type of engines offer the greatest fire hazard?
- (59) Where is the accessory section located?
- (60) What material is used in the construction of the fire wall?
- (61) What is the purpose of the fire wall?
- (62) What section is given first consideration in an engine fire?
- (63) Why are the fire walls not considered as fire stops?

For procedure on forcible entry and rescuing of personnel, read section 5 beginning

at "Entry" on pages 39, 40, 41, and 42, of AF Manual 64-25.

EVALUATION (Self).

- (1) What procedure is used when the controls have pinned the pilot to the seat?
- (2) Why is it vitally important to know what not to cut when making forcible entry?
- (3) What is the primary duty of the rescueman after entering a crashed aircraft?
- (4) What precautionary measures must be employed when removing injured personnel?

For administration of first aid, read section XI, page 63, of AF Manual 64-25.

Your instructor will preview TF 1-4596, Management of Air Crew Casualties.

Your instructor will show the film.

Your instructor will review the film.

EVALUATION (Self).

- (1) Which member of the crash crew should be qualified to administer first aid?
- (2) Where should the injured personnel be carried after they have been removed from the aircraft?
- (3) When should the medical personnel be permitted to enter the aircraft?
- (4) Why is the knowledge of first aid essential in crash rescue?
- (5) What is the duty of the linemen when medical personnel enter a crashed aircraft to administer first aid?

You will accompany your instructor to the training area for visual identification of the current types of aircraft located on the training area.

Your instructor will point out the constructional features, forcible entry points, air crew locations, and armament on the different classes of aircraft.

Your instructor, with your assistance, will demonstrate forcible entry, release and removal of dummy personnel, and administration of first aid from a single-engine aircraft.

The rescueman will place the ladder on the left wing, climb on the wing, and release the canopy. If the canopy is jammed, he will use forcible entry tools to force it open. He will release the safety belt and parachute harness on the dummy and apply direct pressure to the wound designated by the instructor. He will climb astride the opened canopy, face forward, grasp the dummy under the arm pits, and lift him straight up. He will turn him so he faces the right wing and set him on the side of the cockpit. The rescueman on the left wing will take the dummy under the arms, hold him until the other rescueman gets hold of his legs, and assist in removing him to the wing. He will then step to the ground and drag the dummy, head first, face up, to the edge of the wing to prevent any possibility of dropping him and causing further injury. Both rescuemen will carry the dummy to a safe place outside the fire area, and continue to apply direct pressure to the wound until he is released to medical personnel and/or the designated crash rescueman.

You will perform forcible entry, release and removal, and administration of first aid to the dummy personnel from a single-engine aircraft as demonstrated by your instructor.

The procedure for making forcible entry into two or more engine aircraft is similar. The entry is made through normal exits or by the forcible entry method. The difference in the two or more engine aircraft will be the location of exits, the type of exits, and the forcible entry points.

When removing personnel through escape hatches, extreme caution must be exercised to prevent further injury.

EVALUATION (Self).

- (1) How does the rescue of personnel differ with different types of aircraft?

- (2) How is entry made into the aircraft?
- (3) What precautions should be taken when removing air crew casualties?
- (4) What procedure is used in removing air crew personnel from single-engine aircraft?

Place the ladder against the fuselage. (NOTE: the type of aircraft will determine the position of the ladder on the aircraft.)

To open the emergency exit, use forcible entry tools if necessary. Release the safety belt and parachute harness on the dummy. Apply direct pressure to the wound. Grasp the dummy under the arms and remove him to the exit with his face up. Stand astride and face the dummy, and lift him to the rescue personnel standing on the ladder.

The rescue personnel standing on the ladder will grasp the dummy under the arm pits and clear the opening before descending the ladder.

The rescueman inside the aircraft will keep a firm grip on both legs and as the rescueman descends the ladder, will place the legs of the dummy, one on either side of the ladder.

Before releasing hold on the dummy's legs, make sure the rescueman on the ground has complete control of the dummy and/or that other rescue personnel are assisting him in removing the dummy.

You will perform the release and removal of dummy personnel from two or more engine aircraft as demonstrated by your instructor.

5. PRACTICAL PROCEDURE.

Your instructor will assign you to a crew and designate the rescue operation to be performed. You will perform the release and rescue operation from single, two, four, and six-engine aircraft, including administration of first aid as designated by your instructor.

You will rotate in each position of the operation. You will assist in making forcible

entry through normal escape hatches as designated by your instructor.

Your instructor will designate the type of the aircraft to be used for the operation. You will perform the rescue operations as outlined in Informational Procedure.

You will perform maintenance on the equipment used in this project.

EVALUATION (Self).

- (1) In what position is the air crew casualty's face when being rescued?
- (2) Why should injured personnel be dragged to the edge of the wing rather than carried?
- (3) Why should the safety belt and the parachute harness be removed before attempting to remove the injured personnel?
- (4) Why is armament given consideration in the rescue operation?
- (5) What is the position of the injured personnel when being taken down the ladder?
- (6) When does the rescueman who is inside the aircraft release his hold on the personnel being rescued?
- (7) What is the position of the rescueman when lifting the injured personnel from a single-engine aircraft?

6. CRITIQUE.

The instructor will conduct a critique of this training project and summarize the following key points:

- (1) Identification of the aircraft.
- (2) Location of the crew members.
- (3) Armament.
- (4) The forcible entry points.
- (5) Placing the ladder.

- (6) Forcible entry.
- (7) Release and removal of personnel.
- (8) Administration of first aid.

7. GRADING POINTS.

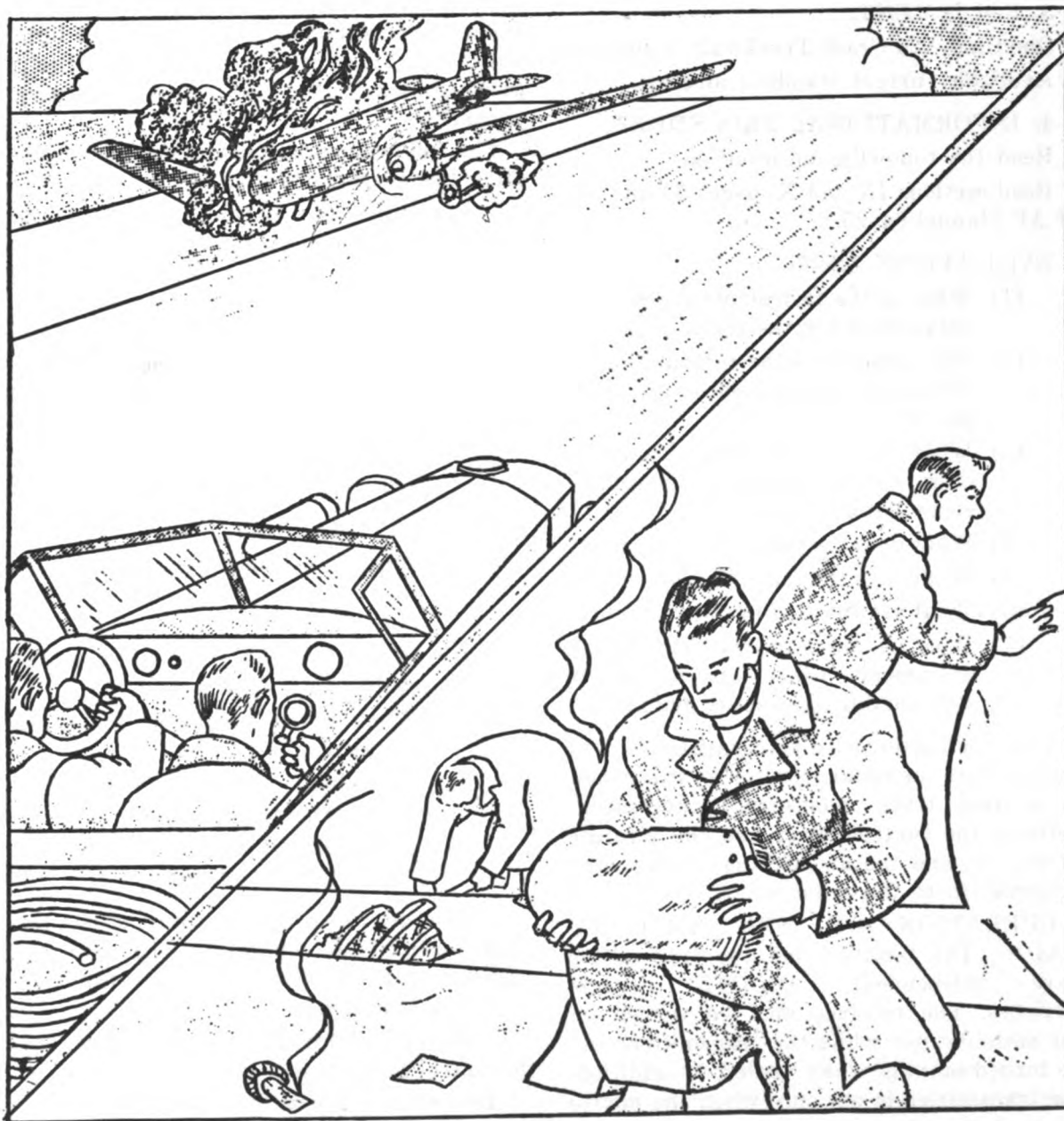
Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student make forcible entry properly?			
2. Did the student place the ladder properly?			
3. Did the student release the dummy before attempting to remove him?			
4. Did the student apply proper first aid while making the rescue?			
5. Did the student keep the dummy's face up while removing him?			
6. Did the student lift the dummy correctly?			
7. Did the student place the dummy's legs on either side of the ladder when removing him by use of the ladder?			
8. Did the student drag the dummy to the edge of the wing?			
9. Did the student on the ladder raise the dummy clear of the opening before descending the ladder?			
10. Did the student administer proper first aid to the dummy during the release and removal?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH

COMMUNICATIONS, PRESERVATION OF EVIDENCE AND OVERHAUL

PART II



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

The procedure for operating communications equipment.

Procedures for overhaul and the preservation of evidence.

2. REFERENCE.

AF Manual 64-25, Aircraft Crash Rescue.

3. EQUIPMENT.

One Class 125 Crash Truck fully equipped.
Available current standard aircraft.

4. INFORMATIONAL PROCEDURE.

Read the following information:

Read sections IX and X, pages 53 and 64, of AF Manual 64-25.

EVALUATION (Self).

- (1) What is the fastest means of communication for the crash crew?
- (2) Who dispatches the information to the crash crew regarding an emergency?
- (3) What information should the crash crew have concerning the emergency before responding?
- (4) What does the term "Roger" mean?
- (5) What does the term "Wilco" mean?
- (6) What are the air-to-ground signals?
- (7) What is the procedure for crash equipment when an alarm is sounded during practice drills?

Your instructor, with your assistance, will demonstrate the radio operator's duties when in a crash truck monitoring conversation between the control tower and the aircraft in the air, and the dispatching of the same information to the crash crew.

OPERATION OF THE TWO-WAY RADIO. The receiver and the transmitter have independent "ON-OFF" toggle switches. The receiver may be turned on for stand-by use while the transmitter may be turned on only when needed. In addition, the transmitter is on, only when the microphone button is pressed.

To operate the receiver, turn the selector to the desired frequency. Turn the power toggle switch to "on", then control the volume as desired.

A green light on the radio panel lights up when the receiver is turned on.

To operate the transformer, turn on the toggle switch, and select the frequency to be used.

Push the microphone button to "talk." When the transmitter is on, a red pilot light will burn. There will be a small neon light glowing when the set is transmitting properly.

The following procedure is used for operating the microphone:

- (1) Press the button, and hold the microphone squarely in front of the mouth, with lips slightly touching the mouthpiece when speaking.
- (2) Speak clearly, and slowly. Do not shout, but speak loud enough so that you can be heard distinctly.
- (3) Do not press the button on the transmitter unless you are actually using the transmitter.

EVALUATION (Self).

- (1) What is the procedure for operating the receiver on the two-way radio?
- (2) When does the green light on the radio panel light up?
- (3) What is the procedure for using the transmitter?
- (4) How should you speak when using the microphone?
- (5) When should the button on the microphone be pressed?

Your instructor, with your assistance, will demonstrate operating the two-way radio, both the receiver and the transmitter, as outlined above.

Tower: Air Force nine-three-four-six, this is central field tower—over.

Tower: Air Force nine-three-four-six B-two-five, 5 miles east of field, coming in for

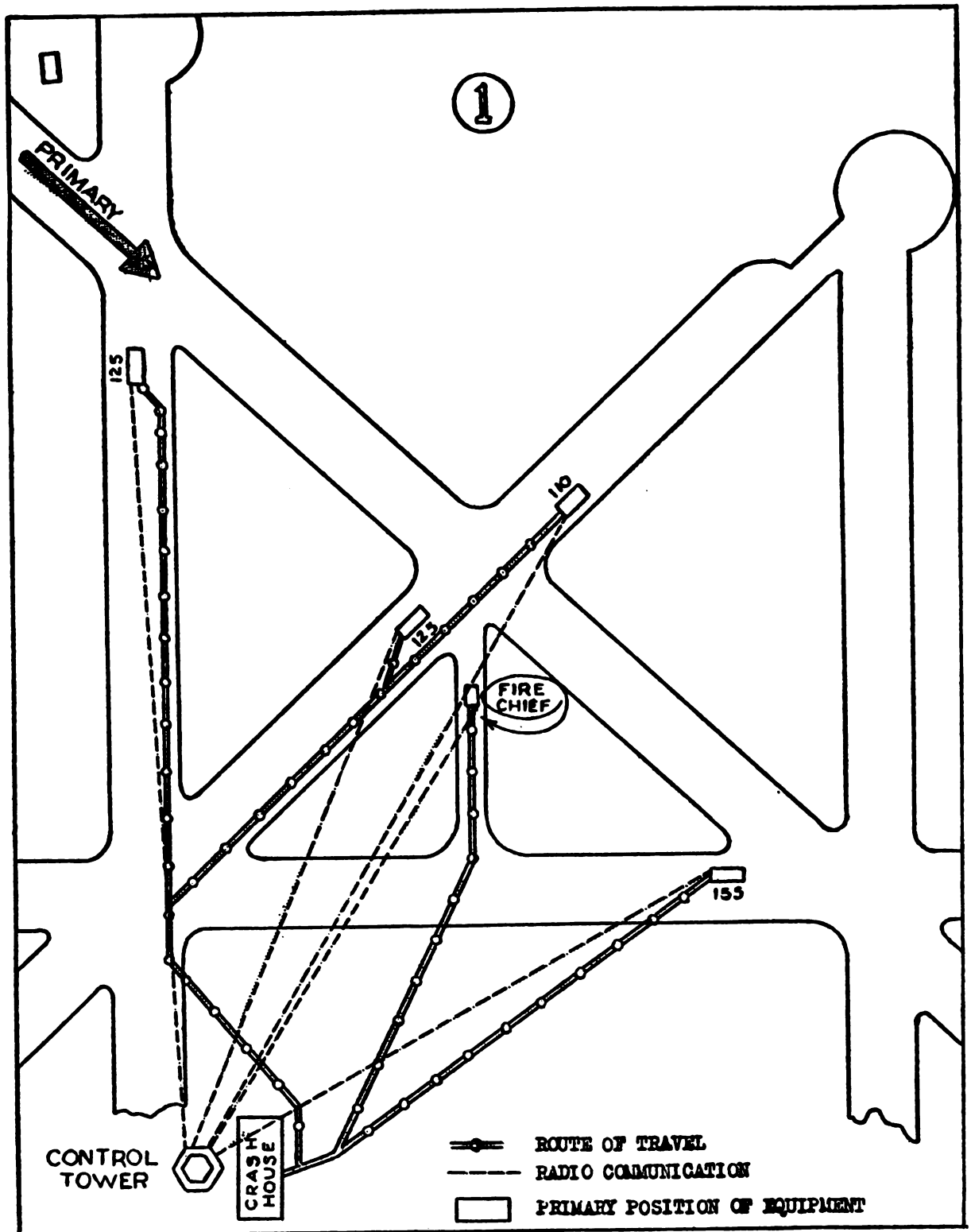


Figure 1.

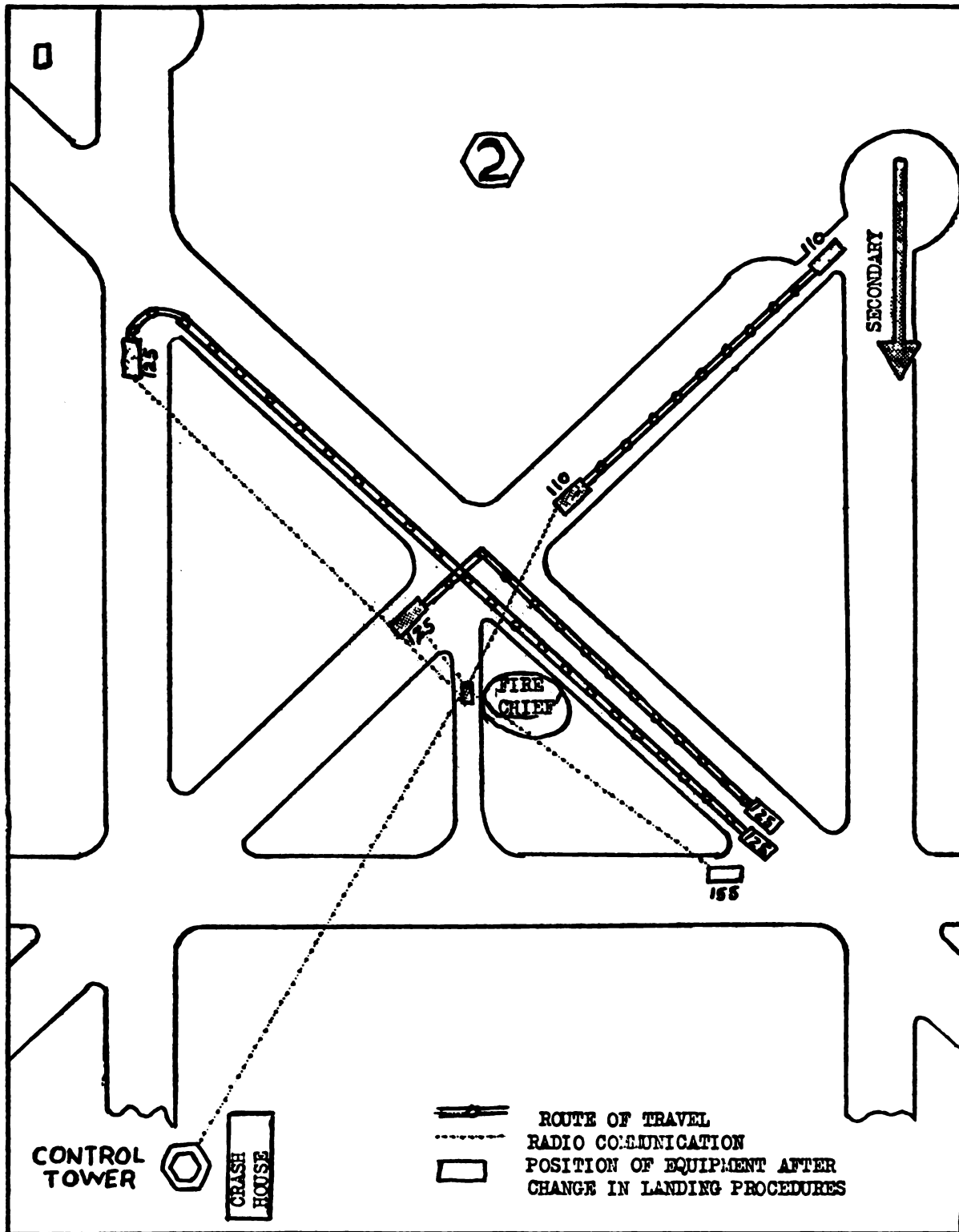


Figure 2.

emergency landing. Left engine on fire. Four men aboard. Use runway number eight. Wind 20 miles southwest. You will be the first to land. Report on base leg—over.

Tower: Red truck five—over.

Red truck five: Central tower, this is red truck five—over.

Tower: Red truck five, this is central tower, execute plan 8—over.

Red truck five: Roger, Wilco, and out.

Red truck five will dispatch information concerning the emergency to other crash trucks.

Your instructor, with your assistance, will demonstrate the directing of the crash truck by use of the two-way radio for an emergency landing as outlined in the diagram on the following page.

For overhaul procedures and preservation of evidence, read section VIII, pages 49 and 50, of AF Manual 64-25.

EVALUATION (Self).

- (1) When does the crash crews' job end at a crash fire?
- (2) What is the value of preserving evidence?
- (3) What must be done by the crash crew before a crashed aircraft is moved?
- (4) Who is called upon to remove classified materials?
- (5) What procedure is followed in the overhaul of the area after the aircraft has been removed?
- (6) Who gives the official release before the aircraft is removed from the crash scene?
- (7) Who makes out the detailed report on the overhaul operation?

Your instructor, with your assistance, will demonstrate and discuss procedures for the overhaul and the preserving of evidence as follows:

- (1) Make a thorough search for smoldering material in and about the aircraft.

- (2) Remove gloves and feel along the fuselage, inside and out, for hot spots.
- (3) During overhaul, observe for any evidence that might determine the cause of the crash.

5. PRACTICAL PROCEDURE.

You will be assigned as the radio operator in a crash truck and receive and dispatch information as outlined in Informational Procedure.

You will assist in performing the overhaul and preserving evidence as outlined in the Informational Procedure.

EVALUATION (Self).

- (1) What is the best means of communication for the crash crew?
- (2) Of what advantage is the radio to a crash crew on an anticipated emergency?
- (3) What is the meaning of "over" when using the radio?
- (4) Why is it necessary to perform the overhaul?
- (5) What is the procedure in performing the overhaul?
- (6) What is the purpose of preserving the evidence?
- (7) Who does the crash fire fighter notify when evidence concerning the crash is found?
- (8) When does the crash crews' job end?

6. CRITIQUE.

Your instructor will conduct a critique of this training project and summarize the following key points:

a. Communication.

- (1) Telephone.
- (2) Radio.
- (3) Terms used in radio communicating.

b. Overhaul.

c. Preservation of evidence.

7. GRADING POINTS.

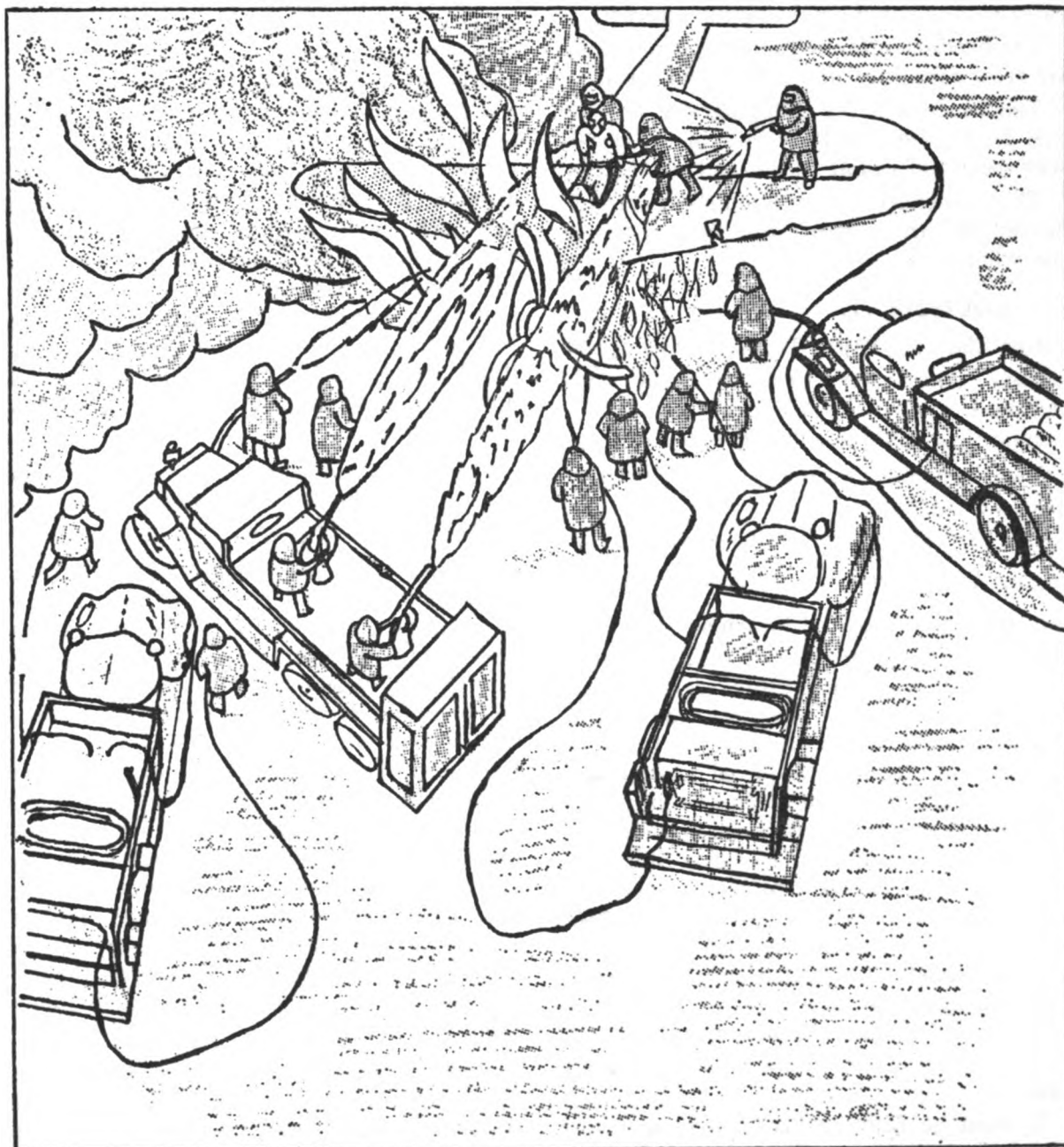
Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student receive the information correctly when using the radio?			
2. Did the student use the correct method in dispatching information on the radio?			
3. Did the student use the proper procedure in performing the overhaul?			
4. Did the student report any evidence as the cause of the fire?			
5. Did the student understand how to position the crash trucks in a stand-by position?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH

SINGLE-ENGINE CRASH FIRES

PART III



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

The procedure for the approach and the positioning of crash trucks on single-engine aircraft.

The procedures for the initial attack and the control of fire around the fuselage section of single-engine aircraft.

The procedure for performing forcible entry into burning single-engine aircraft.

The procedure for releasing and removing air crew casualties under fire conditions.

The procedure for stopping the flow of fuel from ruptured fuel lines in the accessory section of radial, inline, and jet engines.

The procedure for extinguishing ground fire around the aircraft and fire on top of the wing tank.

2. EQUIPMENT.

One Class 110 Crash Truck fully equipped.

Two Class 125 Crash Trucks fully equipped.

One Class 155 Crash Truck fully equipped.

Two dummies, including parachute harness and safety belts.

One salvaged single-engine aircraft.

3. INFORMATIONAL PROCEDURE.

a. Read the following information:

In the event of crash, this procedure may be accepted as the basic insurance for all air crew personnel who must fly our single-engine aircraft. If the procedure is followed, air crew members can be saved from a very hideous death. The basic principle is to control the fire around the fuselage section until all personnel have been rescued. Since the length of time necessary to rescue personnel is unknown, it becomes imperative to effect control of the fuselage section for an indefinite period. The limited supply of extinguishing agent on each type of crash truck makes it an absolute necessity to utilize each ounce of extinguishing agent to its fullest extent.

It must be fully realized where and how

the fuel becomes liberated in order to understand the "why" for the procedures taught. When the aircraft crashes, the impact is such that the fuel lines and the gasoline tanks become ruptured. Ordinarily all of the fuel is not liberated at once, and there is a source that is supplying the fire from either the rupture in the tanks or from the loosened and ruptured fuel lines in the accessory section of the engine. Because the fuel lines are the weaker points for such loosening and ruptures, the accessory section will be given due concern. The control of the fire around the fuselage section under these conditions presents a very complex problem. From the study of the wing tank construction of the aircraft, it is obvious in which direction the force will be relieved in case of an expansion rupture or an explosion. The top portion of the tank is more void of liquid than any other section of the tank. Due to the restraining cushion of the liquid gasoline itself, the explosive force will be directed upward instead of downward or on a horizontal plane.

The initial procedures for rescue of personnel and the extinguishment of single-engine aircraft fires are:

APPROACH. On a fighter-type aircraft, the approach should be made from the tail to avoid the hazard of fixed guns. On a trainer-type aircraft that is not armed, the nose or tail can be selected depending upon the advantage to be gained by the wind direction or the terrain features. Whenever single-engine aircraft crash and a fire does not result immediately, the same procedures are to be followed as outlined for burning aircraft insofar as controlling possible fire by the application of foam. Be especially careful when approaching burning and/or crashed aircraft, and be on the alert for air crew members who may have been thrown or who may have crawled some distance from the crash.

Upon approach, the Class 155 Crash Truck should commence the attack at some distance removed from the aircraft by open-

ing the front turret nozzle and directing the stream of foam at the fuselage. When the truck is turning at a near diagonal for positioning near the burning and/or crashed aircraft, the rear turret nozzle will be opened to control the fire on the near side of the approach whereas the front turret will be able to control the fire on the far side when positioning at the fuselage. In all cases of burning and/or crashed aircraft, apply foam at the fuselage and progress outward until sufficient area has been controlled and/or the instructor has given the order to close the turrets.

POSITION. Position on the nose or tail for reasons assigned in the **APPROACH**. Position as close to the burning and/or crashed aircraft as possible, being consistent with good judgment, wind direction, and terrain features.

ATTACK. The initial attack formation is where both sides of the aircraft are attacked at the same time by personnel from a single crash truck. This attack is established by the crew chief after linemen position themselves on each side of him and progress forward under his directions.

b. EVALUATION (Self).

- (1) What is the most important section of the aircraft to be considered by the crash fire fighting personnel?
- (2) What approach is made by the crash trucks on a single-engine armed aircraft?
- (3) What approach is made by the crash trucks on a single-engine unarmed trainer-type aircraft?
- (4) Where is the initial attack made on the single-engine aircraft?
- (5) Who establishes the lineman's position on the aircraft?

The diagrams on page 3 and 4 indicate the approaching and positioning of each crash truck.

c. Your instructor, with your assistance, will demonstrate approaching, positioning, and the attack formation of crash trucks and

crews on a single-engine fighter-type aircraft.

The first truck to arrive will be the Class 155 Crash Truck. It will make a head-on approach and will position on the tail at a near diagonal. On the approach, the front turret nozzle will be opened as soon as it is within range, and the stream will be directed on the fuselage. As soon as the truck makes its turn for a diagonal position, the rear turret nozzle will be opened and its stream directed on the fuselage.

The **TURRET NOZZLEMEN** will control the fire around the fuselage and work outward. The turret nozzlemen will be signaled to shut off the turrets as soon as a sufficient foam blanket has been laid around the fuselage area. The turretmen will keep both hands on the shutoff valves at all times.

The **CREW CHIEF** will alight from the truck, take his position at the tail of the aircraft, and direct his men.

The **HANDLINEMAN** nearest the fire will open the discharge valves and remove all of the hose from the basket. He will position on the right or left side of the crew chief so that the hose lines from his truck are not crossed. He will assist in the controlling of the fire on the side of the fuselage.

The **HANDLINEMAN** on the opposite side from the fire will alight from the truck and proceed around the rear of the truck to the fire side. He will remove the tunnel hose line and open the discharge valve to the line. He will position on the right or left side of the crew chief so that the hose lines from his truck are not crossed. He will assist in controlling the fire on the side of the fuselage.

The **RESCUEMAN** will alight from the truck, take the crash kit to the point of the operation and open it. He will remove the ladder from the truck, return to the point of operation, and perform duties as directed by the crew chief.

The **DRIVER** will remain in the truck and observe the operation. He will be on the alert to receive signals from the crew chief.

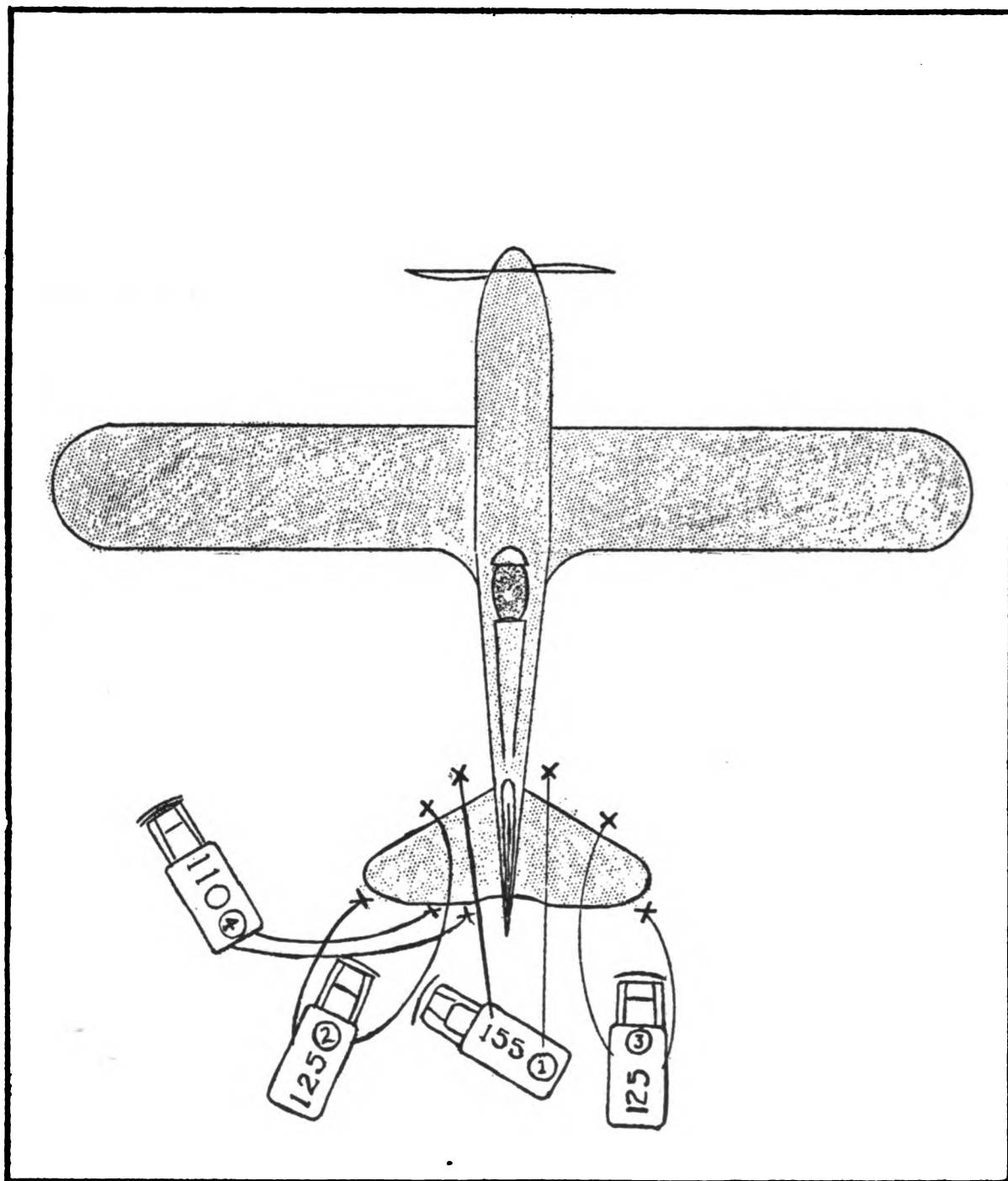


Figure 1. Initial attack formation of crash trucks and handlineman on single-engine fighter-type aircraft (tail approach).

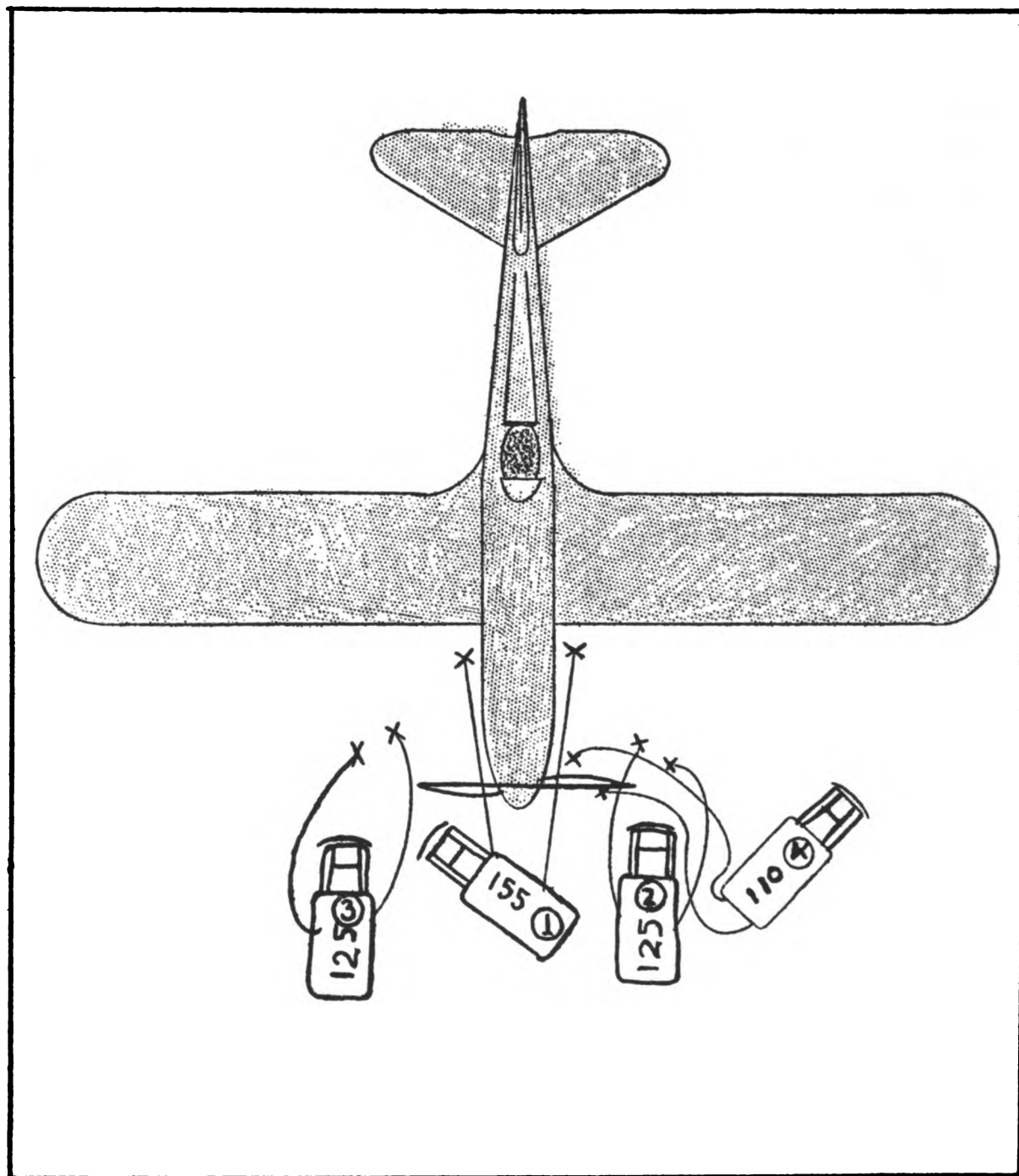


Figure 2. Initial attack formation of crash trucks and linemen on single-engine aircraft (nose approach).

The second truck to arrive will be a Class 125. It will be positioned head-on at the tail and to the left side of the fuselage.

The CREW CHIEF will stop the truck as close to the fuselage as is consistent with good judgment. He will place the gear shift in third gear, and set the hand brake after the pump has been placed in gear. He will alight from the truck, take his position behind and to the left side of the left handline-man from the Class 155, and assist in directing the operation.

The PUMP OPERATOR will place the pump in gear, alight from the truck, maintain the desired pressure, and remove the third line and all of the first aid extinguishers from the truck. He will observe the operation and carry out the orders of the crew chief.

The RIGHT HANDLINEMAN will remove the hose from the right side of the truck and position to the right of his crew chief, enlarging upon the pattern of the left handline-man from the Class 155 Crash Truck.

The LEFT HANDLINEMAN will remove all the hose from the left side of the truck and position to the left of his crew chief, enlarging upon the pattern of the right handline-man.

The RESCUERMAN will alight from the truck, carry the crash kit to the front of the truck, and open it. He will return to the truck, remove the ladder, and carry it to the point of operation. He will carry out such orders as directed by the crew chief.

The third truck to arrive will be a Class 125 Crash Truck, and it will be positioned head-on to the right of the Class 155. The crew chief will position on the right side of the fuselage and to the right of the handline-man from the Class 155. The crew will use the same procedures as outlined for the first Class 100 Crash Truck to arrive, based upon the position assumed by the crew chief.

The fourth truck to arrive will be the Class 110 Crash Truck and it will be positioned at a near diagonal to the left of the Class 125 Crash Truck on the left side of the fuselage.

The PUMP OPERATOR will place the pump gear, set the hand brake with the truck in neutral gear, alight from the truck and maintain the desired pump pressure. He will check the wye gate, straighten the hose lines, remove the first aid fire extinguishers, and take them to the point of operation.

The CREW CHIEF will alight from the truck and take his position behind the line-man on the left side of the fuselage.

The RIGHT HANDLINEMAN will alight from the truck with all the hose and take his position to the left side of his crew chief.

The LEFT HANDLINEMAN will alight from the truck with all the hose and take his position on the right side of his crew chief.

The RESCUERMAN will alight from the truck, remove the crash kit and the CO₂ horn, carry them to the point of operation, open the crash kit and place the CO₂ horn on the open kit. He will return to the truck, remove the ladder, and carry it to the point of operation. He will perform such other duties as directed by the crew chief.

You will perform the operations of approach, positioning and attack formations as demonstrated by your instructor. These operations will be without fire.

Your instructor, with your assistance, will demonstrate controlling a ground fire and stopping the flow of fuel from ruptured fuel lines in the accessory section. He will also demonstrate extinguishing wing tank fires. (NOTE: Fire will be present on the ground only.)

The Class 155 Crash Truck, with crew fully bunkered and pump running at full pressure, will stand by during the spilling of the gasoline for the training fire.

The instructor will notify the crew chiefs which side of the engine the plugging operation will first be performed. The crew chief will advance the two front linemen to the accessory section, and direct the outside lead line-man to change to a flat pattern. The flat pattern will be turned to a vertical position

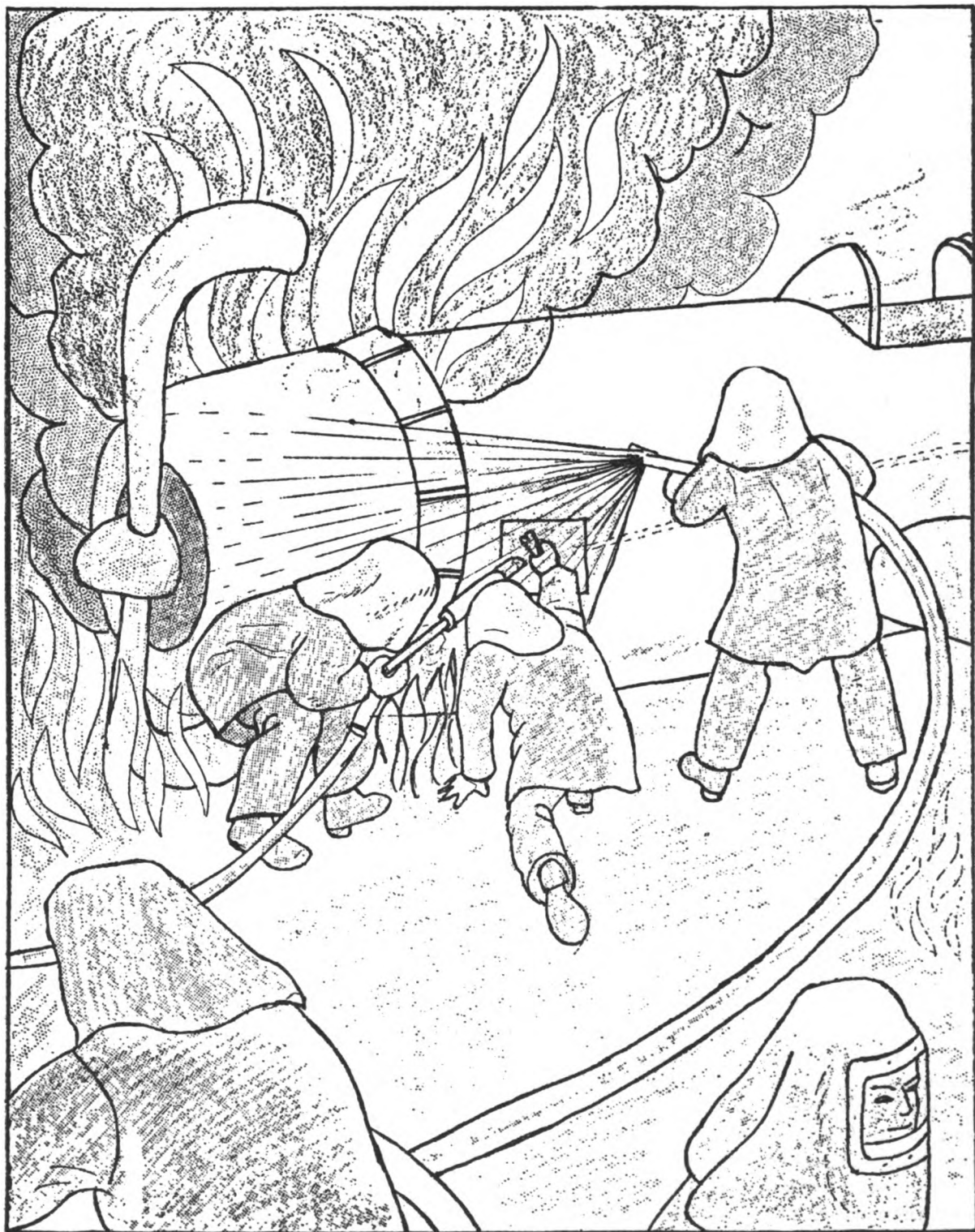


Figure 3.

and held across the panel of the accessory section, directed toward the wing section.

The lineman with full foam-fog pattern, will assist in controlling the ground fire under the engine. He will position next to the wing on the right side of the flat pattern handlineman.

The back-up linemen will control the ground fire.

The crew chief will notify the rescueman to carry and place the ladder in the "A" position with the rungs next to the accessory section between the full-fog and flat pattern. The rescueman will climb the ladder on the side next to the accessory section and remove the panel plate with a dzus key. When the panel is removed, full foam-fog will be directed into the opening. The rescueman will locate the ruptured fuel line and stop the flow of fuel by plugging the opening. The rescueman will remove the ladder and the handlinemen will extinguish the ground fire.

The ladder will be placed in a position to extinguish the wing tank fire. The flat pattern will be directed parallel to the wing and toward the end.

The lineman will climb the ladder next to the wing with the nozzle closed. When he is in position, he will open the nozzle and place the flat pattern across the opening. He will bring the outside of the pattern down first, then flatten the pattern by lowering the nozzle.

The second ladder will be placed in position, and the rescueman will climb the ladder with the CO₂ horn from the Class 110 Crash Truck. He will open the discharge valve on the CO₂ horn and position it through the flat pattern.

You will perform the operations of approaching, positioning, attack formation, controlling ground fire, simulating the stopping of the flow of fuel from the ruptured lines in the accessory section, and extinguishing the wing tank fire as demonstrated by your instructor. (Fire will be present only under the engine. No gasoline will be in the tanks.)

Your instructor will demonstrate the stopping of the flow of burning gasoline from ruptured fuel lines and extinguishing the fire in the wing tank. This demonstration will be the same as the previous demonstration with fire present in the wing tank and the accessory section. You will perform the operation of stopping the flow of burning fuel from the ruptured fuel lines and extinguishing the wing tank fires.

Your instructor, with your assistance, will demonstrate forcible entry under fire conditions, release and removal of entrapped personnel, administration of first aid during release and removal, and overhaul and preservation of evidence. (Fire will be present in the wing tank and around the aircraft.)

The rescueman will open the ladder and place one section across the left wing next to the fuselage. The other section will be on the ground. The rescueman will climb the ladder and release and open the canopy, either by normal release or by the use of forcible-entry tools.

One designated rescueman will climb astride the opened canopy. The rescueman on the left wing will release the dummy's safety belt and parachute harness and apply direct pressure on his upper left arm.

The rescueman who is astride of the cockpit will grasp the dummy under his arm pits and lift him clear of the cockpit, placing his buttocks on the side of the cockpit. The rescueman on the left wing will hold the dummy in this position until the other rescueman grasps the dummy's legs and lays him on the wing. The dummy will be dragged to the edge of the wing head first, and the rescuemen will remove him from the wing, and carry him to an area outside the fire.

The crew chief will perform the overhaul operation by making a close observation in and around the fuselage. He will remove his glove and feel for hot spots with his bare hand.

The crew chief will note any evidence that might have caused the crash and/or fire and report all findings to the instructor.

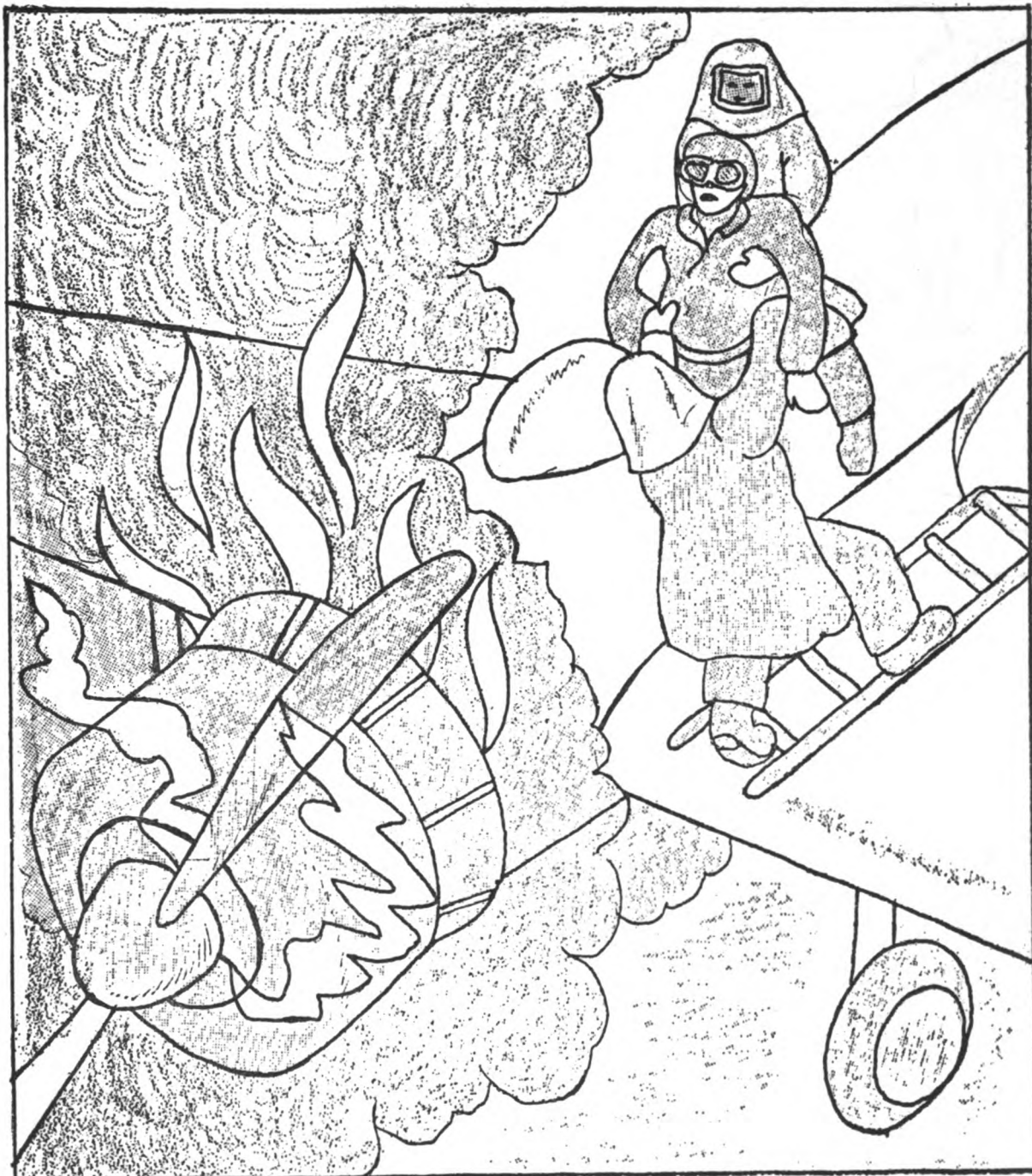


Figure 4.

Rescue man will grasp person to be rescued under the armpits with face up. Lift person to edge of fuselage, assistant will take him down ladder.

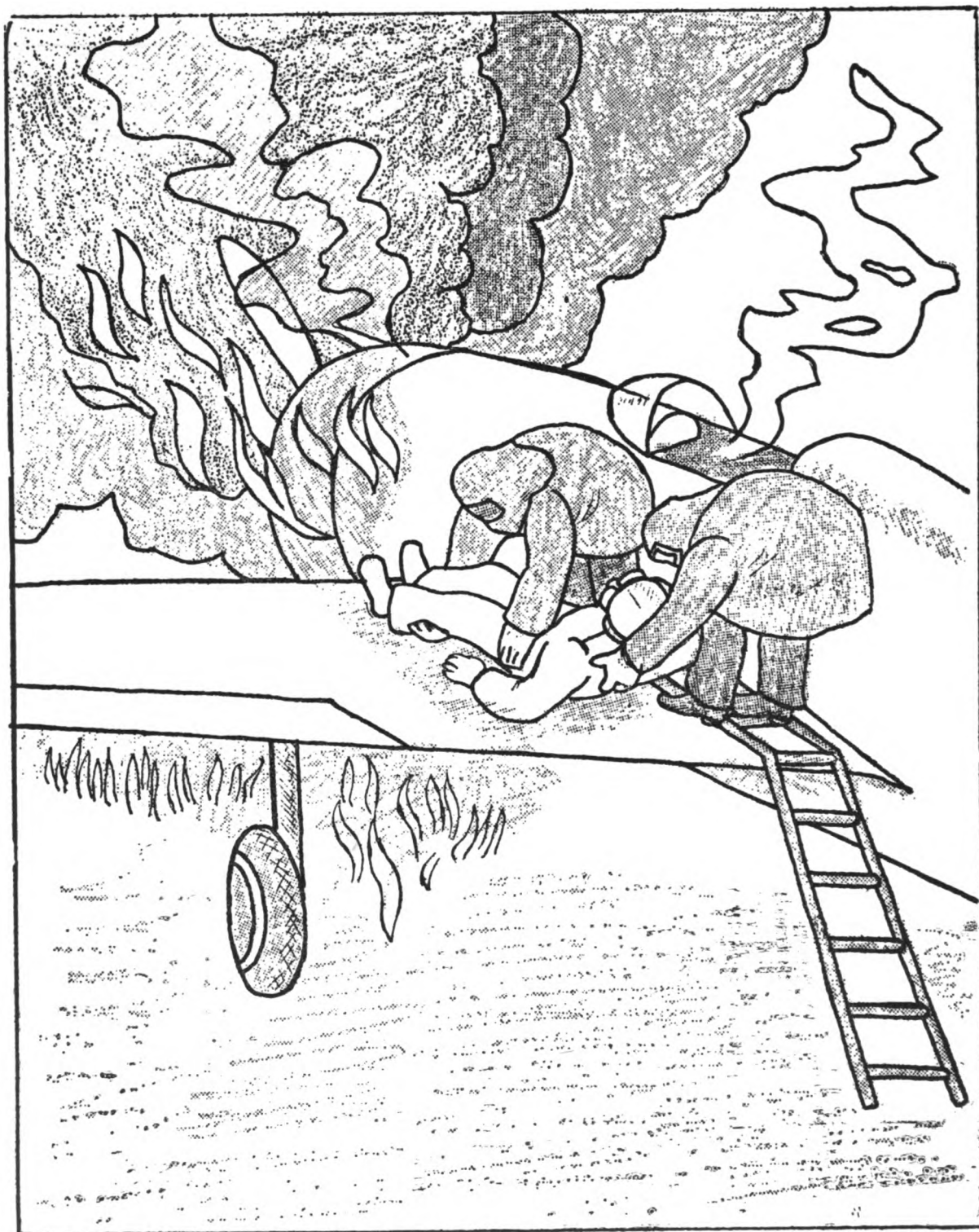


Figure 5.

You will perform the following duties as demonstrated by your instructor:

- (1) Crew Chief.
- (2) Pump Operator.
- (3) Handlineman.
- (4) Turretman.
- (5) Rescueman.

After approaching, positioning, attacking and controlling the fire around the fuselage, open the canopy by use of the normal release and/or with forcible entry tools. Release, administer first aid to and remove air crew casualties. Stop the flow of fuel from the ruptured fuel line, extinguish fire on the ground and in the wing tank, perform overhaul operation, and preserve evidence.

4. PRACTICAL PROCEDURE.

Your instructor will assign you to a crew of 5 on the Class 125 and 110 crash trucks and a crew of 7 on the Class 155 Crash Truck. Your position will be designated, and you will rotate positions until you have performed each individual duty on each truck.

Your instructor will designate the area for the crash fire station from where the response will be made. The instructor will state whether the simulated crash is a trainer or fighter and the sequence of the arrival of each crash truck.

Dummy personnel will be placed in the path of the approach to aircraft. Drivers will proceed with caution to prevent running over dummy personnel who may have been thrown or crawled from burning and/or crashed aircraft. (NOTE: Speed limit on the burning grounds is 10 m.p.h.)

The Class 155 Crash Truck, with crew fully clothed and pump running at full pressure, will stand by during the discharging of gasoline for training fires.

Should the gasoline ignite prematurely, the turret nozzlemen will cover the safe retreat of the personnel discharging the gasoline.

The Class 155 Crash Truck will then follow the refueling unit and extinguish any

remaining fire. The other crash trucks will respond and carry out the procedures as if planned.

No person other than the instructor will ignite the gasoline.

You will perform your assigned duties in approaching the positioning of the crash trucks on the burning aircraft (single-engine fighter).

Your instructor will signal for the response.

You will assist in attacking the fire after approaching and positioning the Class 155, 125, and 110 Crash Trucks on the burning aircraft as outlined and demonstrated in the Informational Procedure.

You will assist in controlling and maintaining control of the fire around the fuselage section until directed by your instructor to stop the flow of fuel in the accessory section.

You will assist in the forcible entry operation of the aircraft.

You will assist in the release and removal of the dummy personnel from the burning aircraft, and the administering of first aid.

You will assist in stopping the flow of fuel from the accessory section of the aircraft by plugging the line, extinguishing the fire on the ground, and extinguishing the fire on top of the wing tank.

You will assist in the overhaul and preservation of evidence. (NOTE: For chart 10, you will report that the pilot was not wearing earphones).

You will assist in reloading the hose and equipment on the crash trucks.

The following procedures are used for a crash which does not immediately result in a fire.

You will make a head-on approach, position on the nose of the aircraft representing a trainer-type aircraft (not armed), and carry out the same procedures as outlined for a burning fighter-type aircraft.

You will assist in performing inspection and maintenance of the equipment used in this project.

You will assist in performing "driver's" maintenance on the truck and equipment, including washing and polishing.

EVALUATION (Self).

- (1) When does the Class 155 Crash Truck begin to discharge the extinguishing agent upon a burning and/or crashed aircraft?
- (2) Upon what part of the aircraft does the crew concentrate initially?
- (3) Is the ground fire or the wing tank fire extinguished first?
- (4) What procedure is used in stopping the flow of fuel from the broken lines?
- (5) What is the difference in procedure for crashes involving fire and those not involving fire?
- (6) What is the procedure for the crew on the Class 155 Crash Truck if the fire ignites while the gasoline is being discharged for the training fire?
- (7) How close should crash trucks be positioned to burning aircraft?
- (8) What precautions should be taken when approaching the aircraft?
- (9) In what position is the ladder placed on the wing when making the rescue?
- (10) What patterns are used when extinguishing the wing tank fires?
- (11) What is the procedure for setting up protective patterns on the accessory section?
- (12) What is the procedure for using CO₂ when extinguishing wing tank fires?
- (13) What is the procedure for climbing the ladder to extinguish the wing tank fires?
- (14) Who establishes the lineman's position on the aircraft?

5. CRITIQUE.

The instructor will conduct a critique of

this training project and will summarize the following key points:

- (1) Approach and positioning.
- (2) Initial attack and control of the fire.
- (3) Forcible entry under fire conditions.
- (4) Release and removal of entrapped personnel under fire conditions.
- (5) Stopping flow of fuel under fire conditions.
- (6) Extinguishing the ground fire.
- (7) Extinguishing the fire on top of the wing tank.
- (8) Overhaul and preservation of evidence.

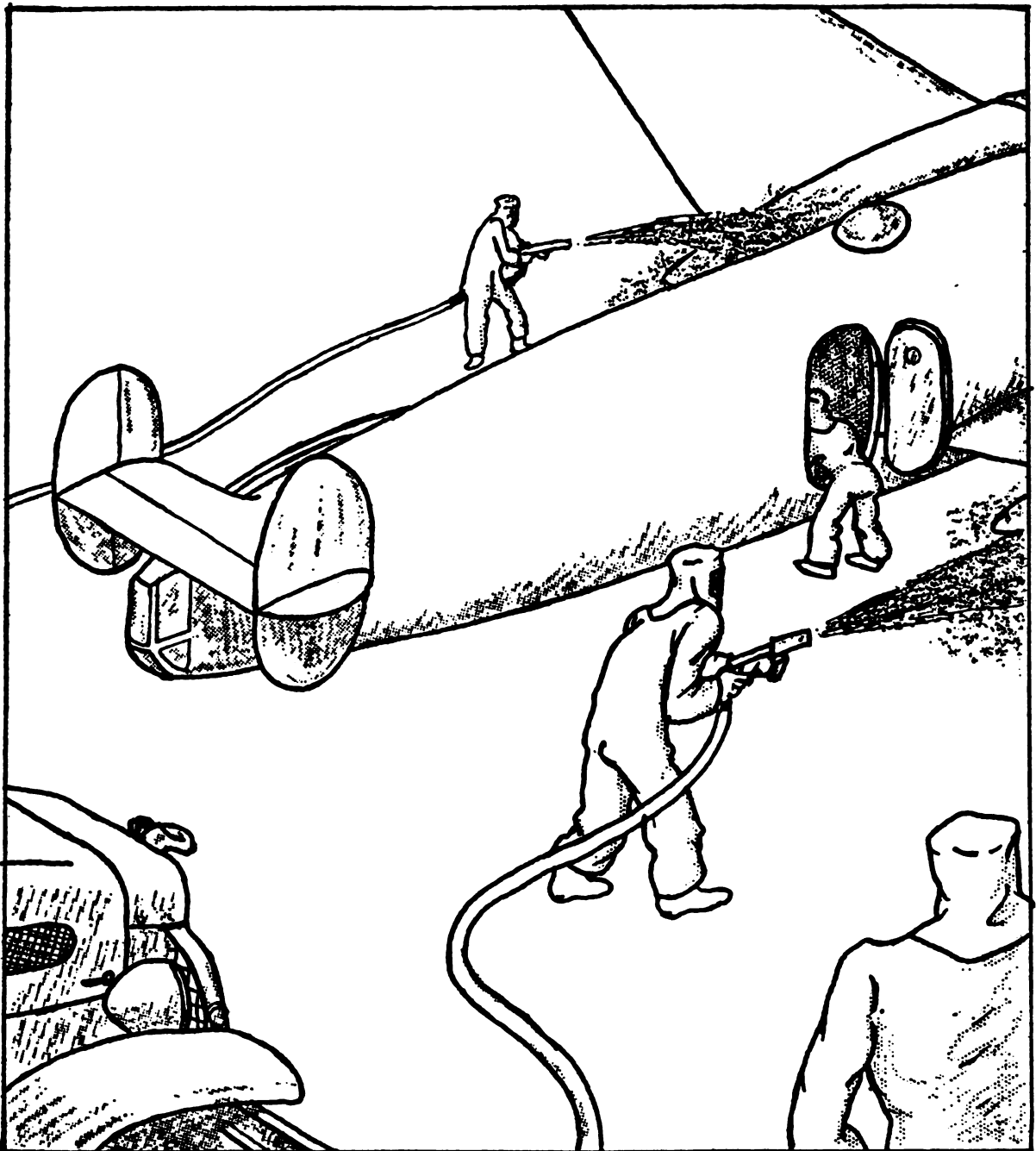
6. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student make the proper approach?			
2. Did the student make the proper positioning?			
3. Did the student release the dummy before attempting to remove him?			
4. Did the student use the correct procedure to stop the flow of fuel?			
5. Did the student control and/or extinguish the fire from the fuselage outward?			
6. Did the student perform overhaul and preserve the evidence properly?			
7. Did the student replace the equipment and perform maintenance properly?			
8. Did the student place the ladder on the left wing next to the fuselage?			
9. Did the student have the nozzle closed while climbing the ladder?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH

TWO-ENGINE CRASH FIRES



FOR TRAINING PURPOSES ONLY

1. PURPOSE.

To teach you procedures for:

Approach and positioning of crash trucks on two-engine aircraft.

Initial attack and control of fire around fuselage section.

Performing forcible entry under fire conditions.

Releasing and removing air crew casualties under fire conditions.

Stopping the flow of fuel from ruptured fuel lines in the accessory section of two-engine aircraft.

Extinguishment of ground fire around the aircraft and on the top of the wing tanks.

2. EQUIPMENT.

Two Class 125 Crash Trucks fully equipped.

One Class 150 Crash Truck fully equipped.

One Class 155 Crash Truck fully equipped.

Seven dummies, including parachute harness and safety belts.

One salvaged two-engine aircraft.

3. INFORMATIONAL PROCEDURE.

Read the following information:

The procedure for the rescue of personnel from two-engine aircraft is similar to that of the single-engine aircraft; however, the number and location of the air crew, and the amount of fuel carried will make the rescue operation a more complex job. For these reasons, it is necessary the crash crew be familiar with the different types of two-engine aircraft. Two-engine aircraft consist of cargo, bombardment, and fighter-type aircraft as outlined in TPO-FFI-205, Part I.

The differences in types of two-engine aircraft will alter the number of personnel, gasoline capacity, and armament. The twin fuselage F-82 creates a still different condition with regard to crash rescue. There are two separate fuselages, and two separate cockpits that may require forcible entry before the rescue can be performed. This operation must be accomplished simultaneously,

since each fuselage will require adequate protection during the rescue operation.

It should be remembered that in bombardment and fighter-type aircraft, armament is the fire fighter's number one enemy. Due to this condition, the approach and positioning must be made on the tail. The cargo-type two-engine aircraft has no armament, and can be approached from the nose or the tail, using the wind and terrain to the best advantages. Cargo-type aircraft used as personnel carriers should be approached from the tail.

APPROACH. All crash trucks will make a head-on approach, keeping a sharp lookout for personnel who may have been thrown, or who have crawled from the aircraft into the path of the approaching crash trucks.

POSITIONING. The Class 150 and the Class 125 Crash Trucks will be positioned head-on. The Class 155 Crash Trucks will be positioned at a near diagonal as close to the crashed and/or burning aircraft as possible, and consistent with good judgment. The initial attack formation is, where both sides of the fuselage are attacked at the same time. This position will be established by the crew chief.

EVALUATION (Self).

- (1) What is the procedure for approaching bombardment-type aircraft?
- (2) What is the procedure for approaching cargo-type aircraft when used as personnel carriers?
- (3) What is the initial area to be controlled on a two-engine aircraft?
- (4) Who establishes the linemen's positions?

Your instructor, with your assistance, **WITHOUT FIRE**, will demonstrate the approach, positioning, and attack formation of crash trucks and crews on two-engine cargo-type aircraft used as personnel carriers.

The first truck to arrive will be the Class 150 Crash Truck. It will make a head-on approach, and position on the tail. If the terrain will permit, the boom nozzle will be

swung into operating position while the approach is being made. The radiator nozzle will be swung into operating position while approaching.

The panel operator will be discharging CO₂ and foam from the boom, radiator nozzle, and ground sweep, as soon as the truck comes within range. He will direct the extinguishing agents at an angle on the fuselage to control the fire around the fuselage section. As soon as a sufficient foam blanket has been laid around the fuselage section to secure protection of air crew members, the CO₂ will be shut off. (NOTE: The instructor will signal the panel operator when to shut off the CO₂ and foam.)

The DRIVER will position the Class 150 Crash Truck, and remain in the cab to observe the operation and watch for signals from the crew chief and instructor.

The CREW CHIEF will alight from the truck, take his position at the tail of the aircraft, and direct the handlinemen in the operation.

The RIGHT PLAYPIPEMAN will alight from the truck with the CO₂ playpipe, take his position at the right of his crew chief, and control the fire along the right side of the fuselage, discharging CO₂ at intervals as needed or as directed by the instructor.

The RIGHT FOAM LINEMAN will alight from the truck, remove all the CO₂ line from the hose reel, remove all the foam line, open the pilot valve, and position just behind the righthand CO₂ playpipeman, securing the area being controlled by the playpipeman with the foam blanket.

The LEFT FOAM LINEMAN will perform the same procedures as outlined for the right foam lineman except that he will set up back of the left CO₂ playpipeman.

The second truck to arrive will be the Class 155 Crash Truck. This truck will make a head-on approach on the tail of the aircraft, and position at a near diagonal on the left side of the aircraft. On the approach, the front turret will be opened when within range of the aircraft, discharging foam on

the fuselage. As the truck makes the turn for the near diagonal position, the rear turret will be opened, and foam stream will be directed on the fuselage. The turret will control the fire around the fuselage, and work outward. When the fuselage area has been controlled, and a sufficient blanket of foam has been laid, the instructor will signal the turretmen to shut off the turrets. Turretmen will stand by, ready with hands on the valve control, and closely observe the entire operation.

The CREW CHIEF will alight from the truck, take his position on the left side of the left CO₂ playpipeman, and direct his men.

The HANDLINEMEN nearest the fire will open the valve and charge the line. He then will remove all the hose, advance to, and take his position on the left or right side of his crew chief, and control the fire on the fuselage.

The HANDLINEMAN on the opposite side of the fire will alight, and proceed to the right side of the truck. He will remove the tunnel line, open the valve, and charge the line. He will take his position behind and to the outside of the handlineman from the Class 155.

The RESCUERMAN will alight from the truck with the crash kit, take it to the point of operation, and open it. He will return to the truck, remove the ladder, return to the point of operation, and perform such duties as directed by the crew chief.

The DRIVER will remain in the truck and observe the operation. He will be alert at all times for signals from the crew chief.

The third truck to arrive will be the Class 125 Crash Truck. It will make a head-on approach on the tail of the aircraft and position head-on to the right of the Class 150.

Each of the operating personnel will perform their duties as described above.

The fourth truck to arrive will be the Class 125 Crash Truck. It will make a head-on approach, and position on the right side of the other Class 125 Crash Truck. The procedure will be the same as for the first Class

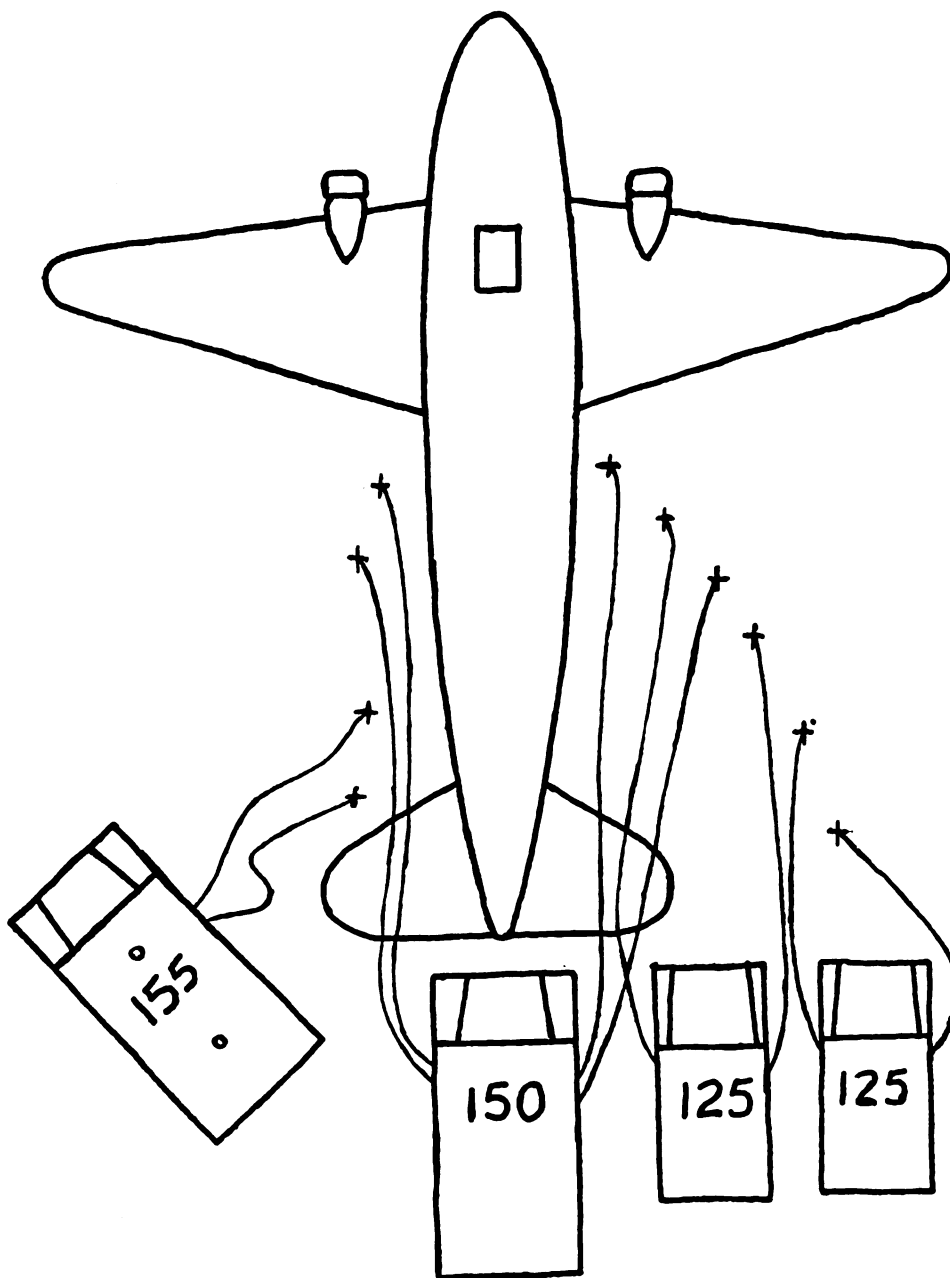


Figure 1. Diagram showing the tail approach on two-engine aircraft.

125 Crash Truck, enlarging upon the pattern and controlling the fuselage area.

You will perform the operation as demonstrated by your instructor. (NOTE: This operation will be without fire.)

GROUND, ENGINE, AND WING TANK FIRES. The ground fire around the engine and the wing tank section must be controlled to enable the crash rescueman to get to the source of the trouble. It must be kept under control while the rescuemen perform the operation of stopping the flow of fuel from the ruptured fuel lines. The flow of fuel must be stopped before attempting to extinguish the ground fire. The ground fire must be extinguished before the wing tank fire in order to prevent a possible flashback. Never climb over or on a wing if it can be avoided. When the fire is in both engines, the flow of fuel should be stopped in both engines at the same time.

EVALUATION (Self).

- (1) Why should the ground fire be controlled before stopping the flow of fuel from the ruptured lines?
- (2) Do you extinguish the wing tank fire before or after the ground fire has been extinguished?
- (3) What is the effect on the ground fire when the flow of fuel has been stopped?

Your instructor, with your assistance, will demonstrate the control of the ground fire while stopping the flow of fuel from the ruptured fuel lines in the accessory section. He will demonstrate extinguishing ground fires and wing tank fires. (NOTE: There will be fire in the wing tank, in the accessory section, and on the ground around the engine.)

Upon a signal from your instructor to stop the flow of fuel, the crew chiefs will move the handlinemen down along both sides of the fuselage at the same time.

LEFT SIDE. The crew chief from the Class 150 will direct and lead lineman on the left side of the fuselage. The lead linemen are playpipemen from the Class 150

and the right foam-fog lineman is from the Class 155. As the crew chief and lead linemen move up to the accessory section, the back-up linemen will follow them and stay as close as directed by the crew chief.

The playpipeman will position beyond the accessory section with his back toward the nose of the aircraft, face toward the accessory section, and nozzle to his right to control the fire. The foam-fog lineman will change his pattern to a flat pattern and turn it to a vertical position across the accessory section panel, the stream being directed toward the wing section. The foam lineman from the Class 150 will position to the left of the flat pattern next to the wing. The foam lineman from the Class 155 Crash Truck will assist in controlling the ground fire. The crew chief from the Class 155 will direct the positioning of the playpipeman and the foam lineman for back-up protection.

The rescueman will bring in the ladder, and place it in position for the plugging operation. When the rescueman has removed the accessory section plate, the foam lineman from the Class 150 will direct his foam stream through the flat pattern into the accessory section, controlling the area around the ruptured fuel line. The rescueman will locate the ruptured fuel line and stop the flow of fuel by plugging the opening. When the ruptured fuel line has been plugged, the rescueman will remove the ladder, and the handlinemen will extinguish the ground fire, working from the fuselage outward. As soon as the ground fire has been extinguished, the crew chief will position linemen to extinguish the wing tank fire. The ladder will be brought in by the rescueman, and placed in position. The fog lineman will climb the ladder with the nozzle closed. When he is in position on the ladder, he will open the nozzle and place a flat pattern across the opening. A second ladder will be brought in by the rescueman designated by the crew chief and placed alongside the first ladder. The crew chief will instruct the rescueman to bring the bayonet nozzle from the Class 150 Crash Truck, and he will climb the ladder with the nozzle

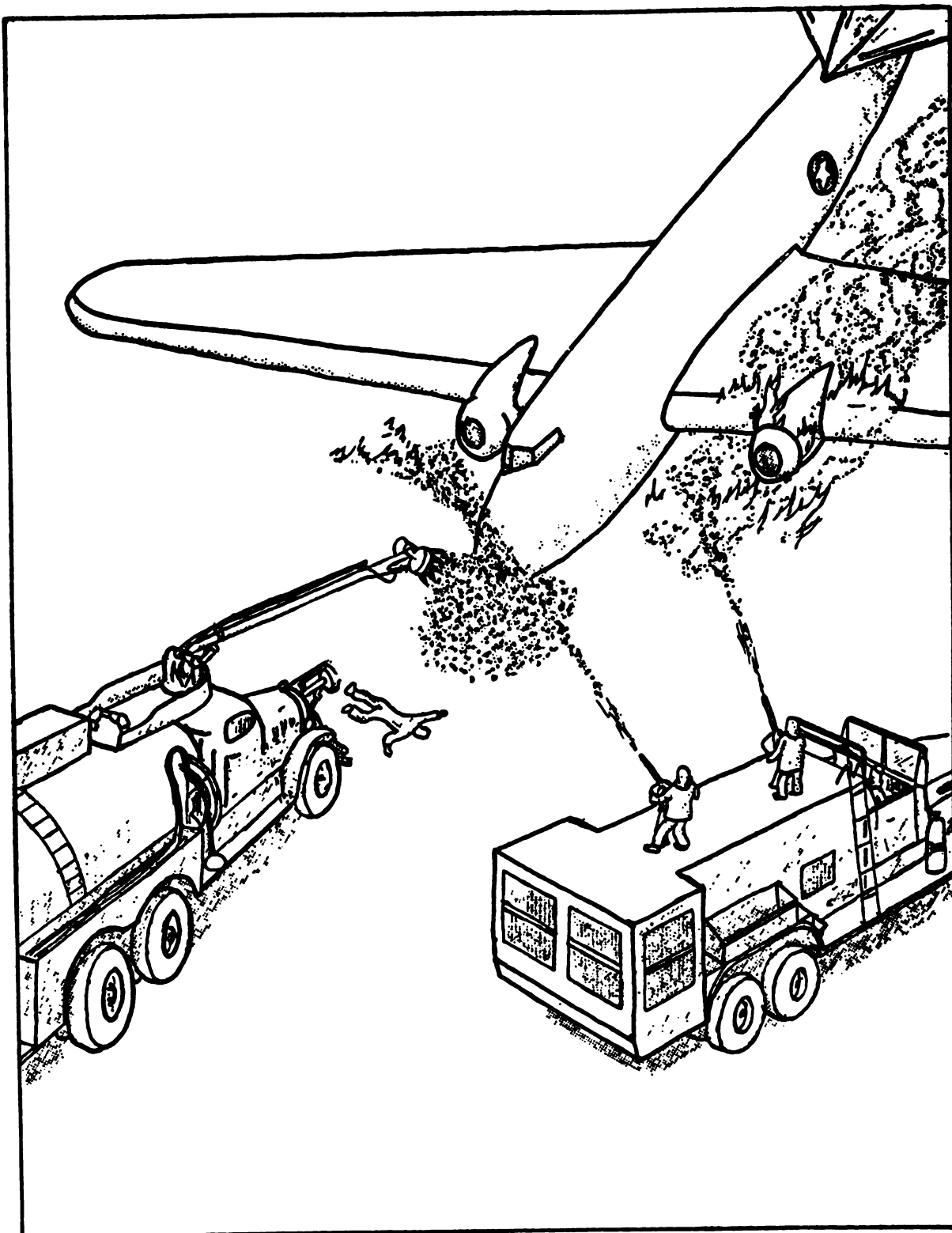


Figure 2. Diagram showing man in path of Crash fire truck.

closed. When in position on the ladder, the crew chief will instruct the rescueman to open the pilot valve. The rescueman on the ladder will direct the stream through the flat pattern in the wing tank and smother out the fire. When the operation is over, the crew chiefs will back the linemen to their initial attack formation.

RIGHT SIDE. The crew chief from the first Class 125 will direct the lead linemen, who are the right playpipemen from the Class 150, and the left foam-fog linemen from the first Class 125. The crew chief from the second Class 125 will direct the back-up linemen. The linemen will advance along the fuselage underneath and/or over the wing to the accessory section next to the fuselage. The playpipeman will take his position beyond the accessory section, with his back toward the nose of the aircraft and the playpipe nozzle to his left side facing the accessory section, and control the fire.

The left lineman from the first Class 125 will change to a flat pattern, and turn the pattern to a vertical position across the accessory section and direct the stream toward the wing section.

The right lineman from the first Class 125 will control the ground fire underneath the engine. He will position next to the wing and on the right side of the flat pattern handlineman.

The rescueman will bring the ladder, place it in position, and remove the accessory section plate.

The right handlineman will direct his full-fog pattern through the flat pattern into the opening of the accessory section, and control the area around the ruptured fuel line.

The rescueman will locate the ruptured line, and stop the flow of fuel by plugging the opening. When the ruptured fuel line has been plugged, the rescueman will remove the ladder, and the handlineman will extinguish the ground fire, working from the fuselage outward.

As soon as the ground fire has been extinguished, the crew chief will position the lineman for extinguishing the wing tank fire.

The ladder will be placed in position. The fog lineman will climb the ladder with the nozzle closed. When he is in position on the ladder, he will open the nozzle and place a flat pattern across the opening. A second ladder will be brought in by the rescueman designated by the crew chief, and placed alongside the first ladder. The crew chief will instruct the rescueman to bring the bayonet nozzle from the Class 150 Crash Truck, and he will climb the ladder with the nozzle closed. When in position on the ladder, the crew chief will instruct the rescueman designated to open the pilot valve. The rescueman on the ladder will direct the stream through the flat pattern in the wing tank and smother out the fire. When the operation is over, the crew chiefs will back the lineman to their initial attack formation.

You will perform the operations for controlling the ground fire, stopping the flow of fuel, and extinguishing the ground and the wing tank fires as demonstrated by your instructor under fire conditions.

FORCIBLE ENTRY, RELEASE, AND REMOVAL OF ENTRAPPED PERSONNEL. You should be able to select the best spots to be used for forcible entry to "save time" in rescuing air crew casualties. You should be ever-alert for bleeding, fractures, and burns to prevent additional injury. By taking these precautions, it may mean the difference between life and death. All crash rescuemen must have a working knowledge of first aid. Air crew personnel may be found inside and/or outside the aircraft. For this reason, the utmost caution must be used when approaching the crashed aircraft.

Only one rescueman will make the initial entry into a crashed aircraft. If help is needed inside the aircraft, he will notify the rescueman waiting outside the aircraft. Entrapped personnel nearest the entry will be removed first to clear the rescue path for the removal of other personnel.

EVALUATION (Self).

- (1) What is the advantage of knowing designated forcible entry points?

- (2) What should the rescueman observe to prevent further injury to air crew members?
- (3) How many rescuemen make the initial entry into a crashed aircraft?
- (4) Why is the person nearest the opening rescued first?

With your assistance, your instructor will demonstrate forcible entry and release and removal of entrapped personnel under fire conditions. (NOTE: Fire will be present in the wing tank and around the aircraft.)

The rescueman will force open the rear exit on the left side, enter the aircraft, locate and release dummy personnel, apply direct pressure to the right shoulder of the dummy, and remove it from the aircraft through the rear exit. The rescueman outside the aircraft will take the air crew casualty to a safe distance from the fire area. This procedure is repeated until all dummy personnel are removed from the aircraft. The instructor will then notify the crew chiefs to have the crew extinguish the fire.

4. PRACTICAL PROCEDURE

You will be assigned to a crash truck, and your position will be designated. You will rotate until you have operated in various positions on all trucks used in this operation.

Your instructor will designate the area for the crash station from where the response will be made, and the sequence of the arrival of the crash trucks.

Three dummies will be placed at spots designated by the instructor. The drivers and other crew members will watch for dummy personnel on the approach.

The Class 150, with crew fully clothed, will stand by with the boom and the radiator nozzle trained on the personnel who are spilling the gasoline. Should the gasoline ignite prematurely, the panel operator will open the discharge on the boom and the front nozzle and cover the safe retreat of the person making the spill. The Class 150 Crash Truck will follow the refueling unit, and extinguish any remaining fire. The other

crash trucks will respond and carry out procedures as planned.

After the gasoline is ignited, the instructor will give the signal to respond.

You will assist in:

- (1) Making the approach, and the positioning of the Class 155, 150, and 125 Crash Trucks on the two-engine fighter-type aircraft.
- (2) Controlling and maintaining control of the fire around the fuselage section until the personnel have been rescued or as directed by the instructor.
- (3) Forcible entry of the aircraft, releasing, and removing of dummies from the aircraft and the administration of first aid as indicated by the instructor.
- (4) The stopping of the flow of fuel by plugging the line.
- (5) Extinguishing the ground fire and the top of the wing tank fire.
- (6) Performing overhaul and preserving the evidence.
- (7) Reloading the hose and the equipment on the crash trucks.

You will assist in:

- (1) Making a head-on approach and positioning the nose of the cargo-type aircraft as outlined in Informational Procedure.
- (2) The approach and positioning on the tail of the bombardment-type aircraft as outlined in Informational Procedure.
- (3) Performing the inspection and maintenance on the equipment used in this project.

The same procedure will be used on aircraft crashes not immediately resulting in fire as those crashes which do result in fire.

EVALUATION (Self).

- (1) When does the Class 150 begin to discharge the extinguishing agent upon the burning aircraft?



Figure 3.

Bringing a Rescued Man down the ladder. His legs must straddle the beam. The rescuer on the wing will hold his feet until he is down far enough so that no further injury will occur when he lets go.

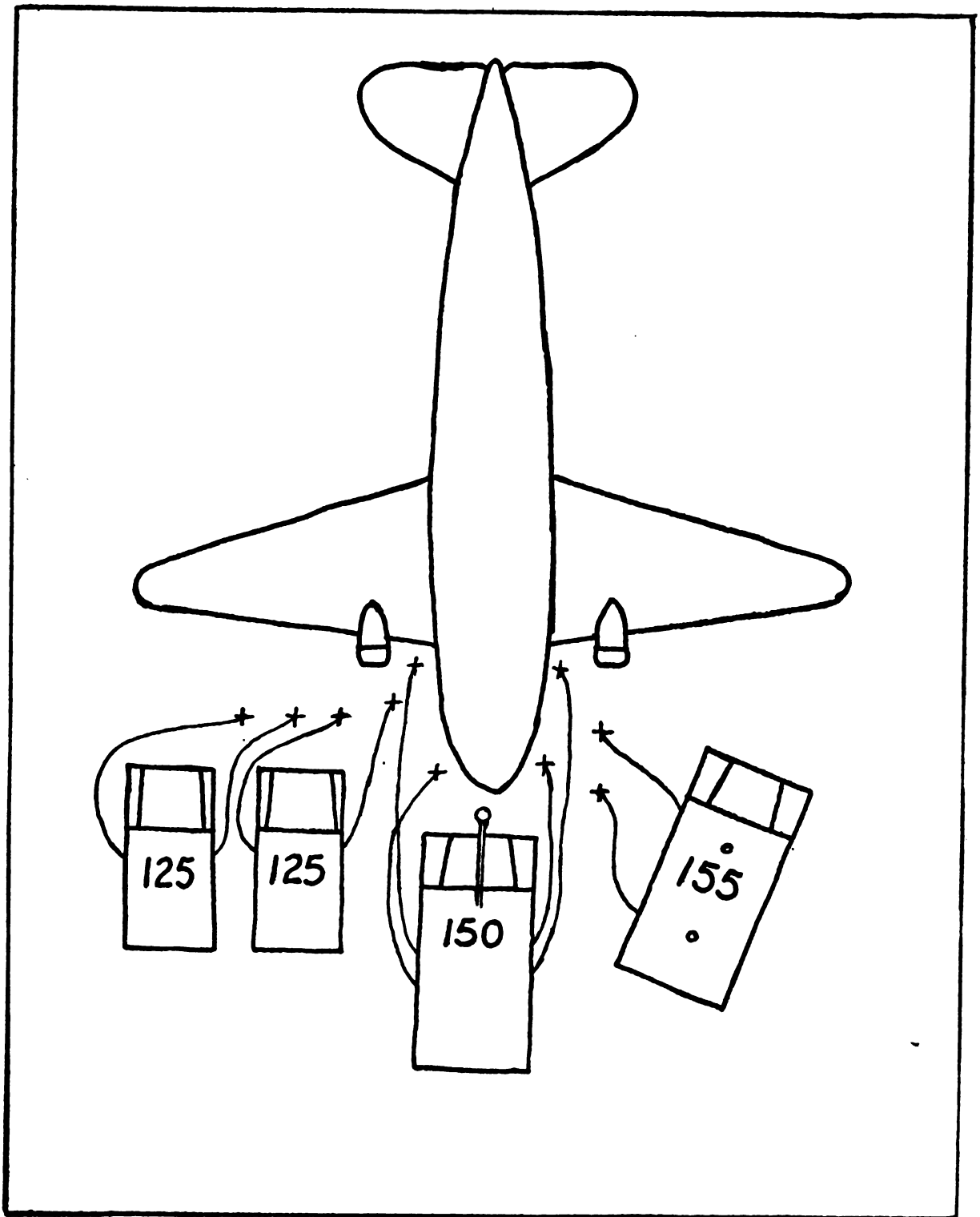


Figure 4.

- (2) What is the procedure for the crew on the Class 150 when the gasoline ignites while the spill is being made?
- (3) What is the procedure for stopping the flow of fuel from ruptured fuel lines?
- (4) What is the procedure for removing personnel from the F-82 aircraft?
- (5) Who establishes the handlinemen's positions for the initial attack?
- (6) From what side of the C-47 is the rescue normally made?

6. CRITIQUE.

Your instructor will conduct a critique of this training project, and summarize the following key points:

- (1) Two-engine aircraft.
- (2) Approach and positioning.
- (3) Attack formation.
- (4) Control of the fire.
- (5) The rescue of personnel.
- (6) Stopping the flow of fuel.
- (7) Extinguishment of ground fires.
- (8) Extinguishment of top of the wing tank fires.
- (9) Overhaul.
- (10) Preservation of evidence.

You will assist in performing "driver's" maintenance on the trucks and equipment

used in this training project, including the washing and polishing of the trucks.

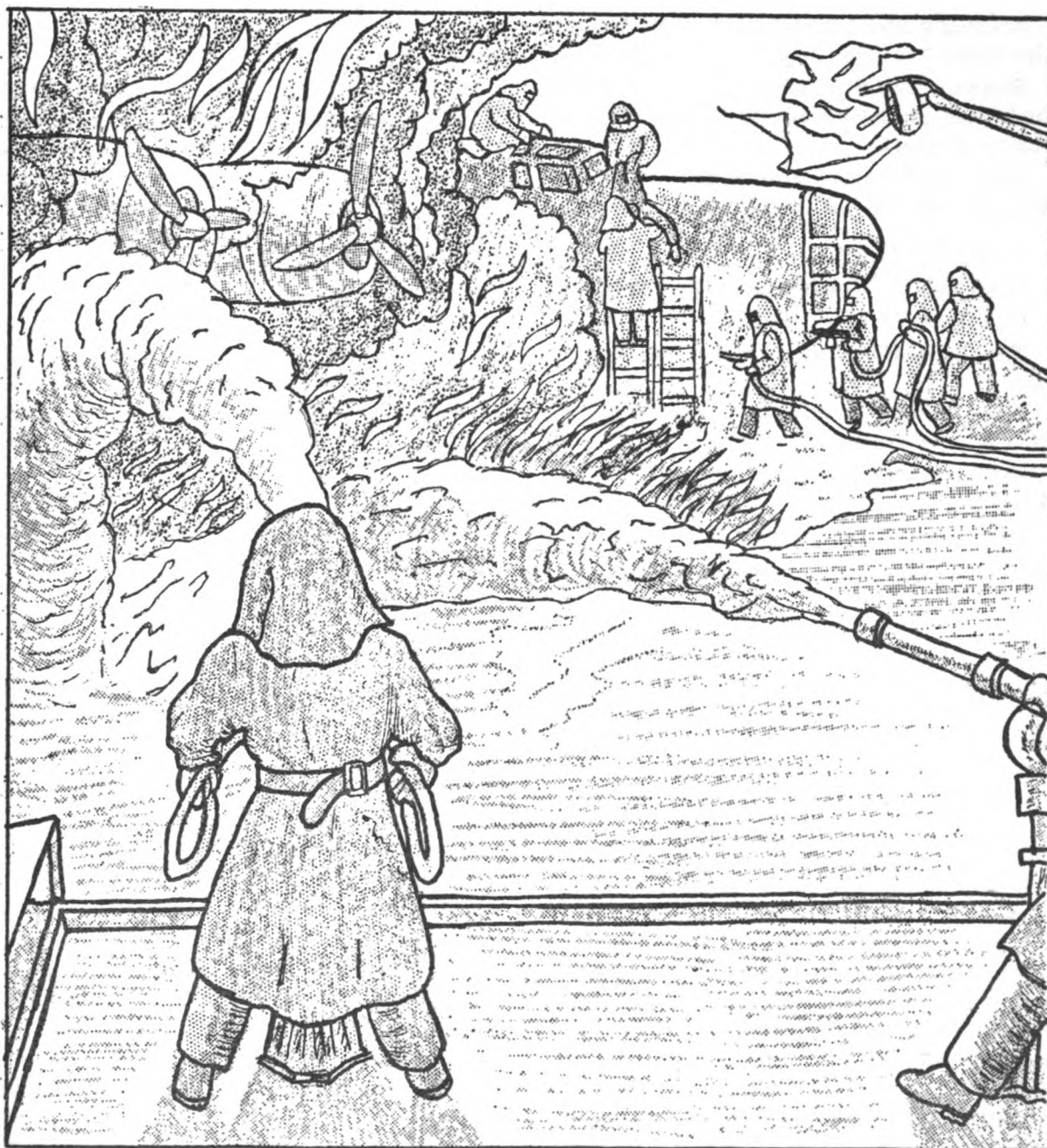
6. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student make the proper approach?			
2. Did the student make the proper positioning?			
3. Did the student control the fire around the fuselage during the rescue?			
4. Did the student rescue the personnel properly?			
5. Did the student stop the flow of fuel from the ruptured line?			
6. Did the student extinguish the ground fire before extinguishing the wing tank fire?			
7. Did the student perform the overhaul after the extinguishment?			
8. Did the student report any evidence that might have caused the fire?			
9. Did the student replace the equipment on the crash trucks properly after the operation?			

**HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO**

**DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH**

FOUR-ENGINE CRASH FIRES



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you procedures for:

Approach and positioning of crash trucks on four-engine aircraft.

Initial attack and control of fire around the fuselage section.

Performing forcible entry under fire conditions.

Releasing and removing air crew casualties under fire conditions.

Stopping the flow of fuel from ruptured fuel lines in the accessory section of four-engine aircraft.

Extinguishment of ground fire around the aircraft and the top of the wing tank.

2. EQUIPMENT.

One class 125 Crash Truck, fully equipped.

One class 150 Crash Truck, fully equipped.

Two class 155 Crash Trucks, fully equipped.

Nine dummies, including parachute harness and safety belts.

Four trainers, wing tank and engine fires, 5 feet high.

One salvaged four-engine aircraft.

3. INFORMATIONAL PROCEDURE.

Read the following information:

With the constant development of aircraft, the crash rescueman's job becomes more and more complex. As in medical science, we are now able to perform operations today that yesterday seemed impossible.

The difference between a single-engine and a four-engine aircraft in crash rescue would be similar to the difference between a small building and a very large building in structural fire fighting. From this comparison, it can be appreciated that aircraft carrying a greater amount of fuel and/or a larger number of personnel aboard, require more knowledge and skill by crash rescuemen to successfully accomplish their most important mission.

APPROACH. The procedure for the approach on a four-engine aircraft will differ

due to the types of aircraft. These types are cargo and bombardment. The approach on the four-engine bombardment-type aircraft should be made on the tail due to the position of the armament. The cargo-type aircraft can be approached from the nose or tail, preferably the tail, utilizing terrain and wind direction to the best advantage. When cargo-type aircraft are used as personnel carriers, the tail approach should be made.

POSITIONING. Position on the tail of the four-engine bombardment-type aircraft and on the tail of four-engine cargo-type aircraft when used as personnel carriers. Position crash truck as close as possible to the burning and/or crashed aircraft, being consistent with good judgment, wind direction, and terrain features.

ATTACK. The initial attack formation is where both sides of the aircraft are attacked at the same time by a single crash truck. This attack is established by the crew chief. The linemen will position themselves on each side of the crew chief and progress forward under his directions. Additional equipment and crash crewmen will set-up on the initial attack, enlarging upon the pattern.

EVALUATION (Self).

a. How can four-engine aircraft be compared with the single-engine aircraft?

b. What are the different types of four-engine aircraft?

c. Why should the wind direction and terrain be considered when making an approach?

d. Why is knowledge and skill of such great importance to a crash rescueman?

e. Where is the initial attack made on a four-engine aircraft? Why?

f. Where should the crash trucks be positioned from the burning and/or crashed aircraft?

See diagram number 1 on positioning and attack formation on the tail of four-engine aircraft.

Your instructor, with your assistance, will

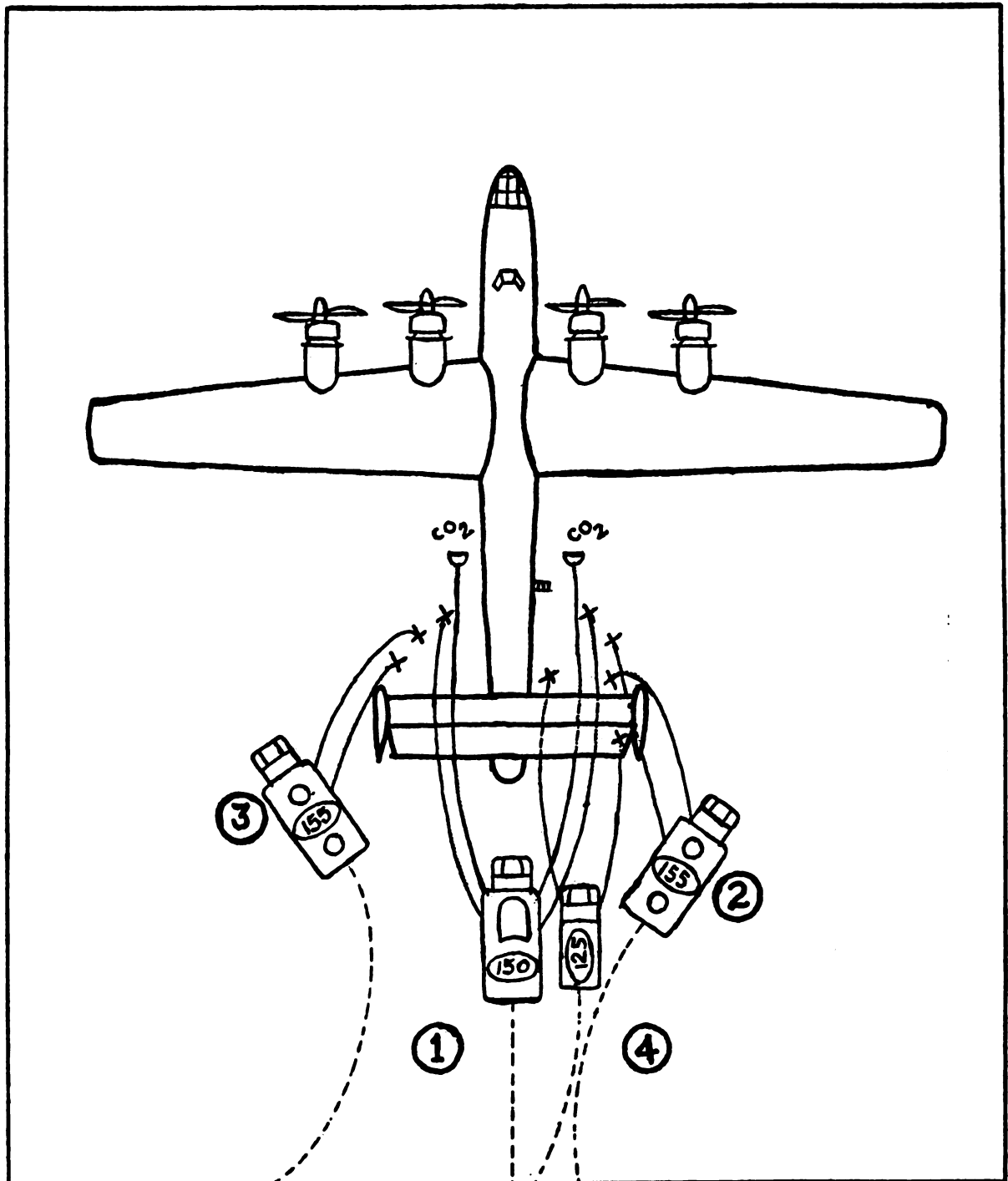


Figure 1.

Diagram #1 showing the positioning of crash fire trucks on the tail of four-engine aircraft.

demonstrate the approach, positioning, and attack formation of crash trucks and crews on four-engine bombardment-type aircraft. (NOTE: No fire will be present.)

The first truck to arrive will be the Class 150 Crash Truck. It will make a head-on approach, and position head-on to the tail of the aircraft. The boom and radiator nozzle will be swung into operating position while the approach is being made (the top boom will be swung only if terrain will permit). The panel operator will begin discharging CO₂ and foam from the boom, radiator nozzle, and ground sweep as soon as the truck comes within range. He will direct the extinguishing agent at an angle on the fuselage.

As soon as a sufficient foam blanket has been laid around the fuselage section to secure protection of the air crew members, the CO₂ will be shut off. (NOTE: The instructor will signal the panel operator when to shut off the CO₂ and foam discharge.)

The DRIVER will position the Class 150 Crash Truck and remain in the cab to observe the operation, and watch for signals from the crew chief.

The CREW CHIEF will alight from the truck, take his position at the tail of the aircraft, and direct the handlinemen in the operation.

The RIGHT PLAYPIPEMAN will alight from the truck with the CO₂ playpipe, take his position at the right of his crew chief, and control the fire along the right side of the fuselage, discharging CO₂ at intervals as needed and/or as directed by the instructor.

The LEFT PLAYPIPEMAN will follow the same procedure as the right playpipe-man except that he will position on the left side of the crew chief.

The RIGHT FOAMLINEMAN will alight from the truck, remove all the CO₂ hose line from the truck, and remove all the foam line, open the pilot valve, and position just behind the right hand CO₂ playpipeman, securing the area being controlled by the playpipe-man with the foam blanket.

The LEFT FOAMLINEMAN will perform the same procedures as outlined for the right foamlineman except that he will set-up to the rear of the left CO₂ playpipeman.

The second truck to arrive will be the Class 155 Crash Truck. This truck will make a head-on approach on the tail of the aircraft, and position at a near diagonal on the left. On the approach, the front turret will be opened when within range of the aircraft, discharging foam on the fuselage. As the truck makes the turn for the near diagonal position, the rear turret will be opened and the foam stream will be directed on the fuselage. The turrets will control the fire around the fuselage and work outward. When the fuselage area has been controlled and a sufficient blanket of foam has been laid, the instructor will signal the turretman to shut off the turrets. Turretmen will stand by, ready with hands on the valve control, and closely observe the entire operation.

The CREW CHIEF will alight from the truck and perform his duties.

The HANDLINEMEN and RESCUEMEN will alight from the truck and perform their duties.

The DRIVER will remain in the truck and observe the operation. He will be alert at all times for signals from the crew chief.

The third truck to arrive will be the Class 155 Crash Truck. It will make a head-on approach and position at a near diagonal on the right side of the fuselage. The crew will perform their duties on the left side of the fuselage as outlined for first Class 155 Crash Truck.

The fourth truck to arrive will be the Class 125 Crash Truck. This truck will make a head-on approach on the left side of the fuselage, and position head-on between the Class 150 and the Class 155 Crash Trucks.

The CREW CHIEF will alight from the truck, and take his position on the left side of the fog lineman from the Class 155 Crash Truck.

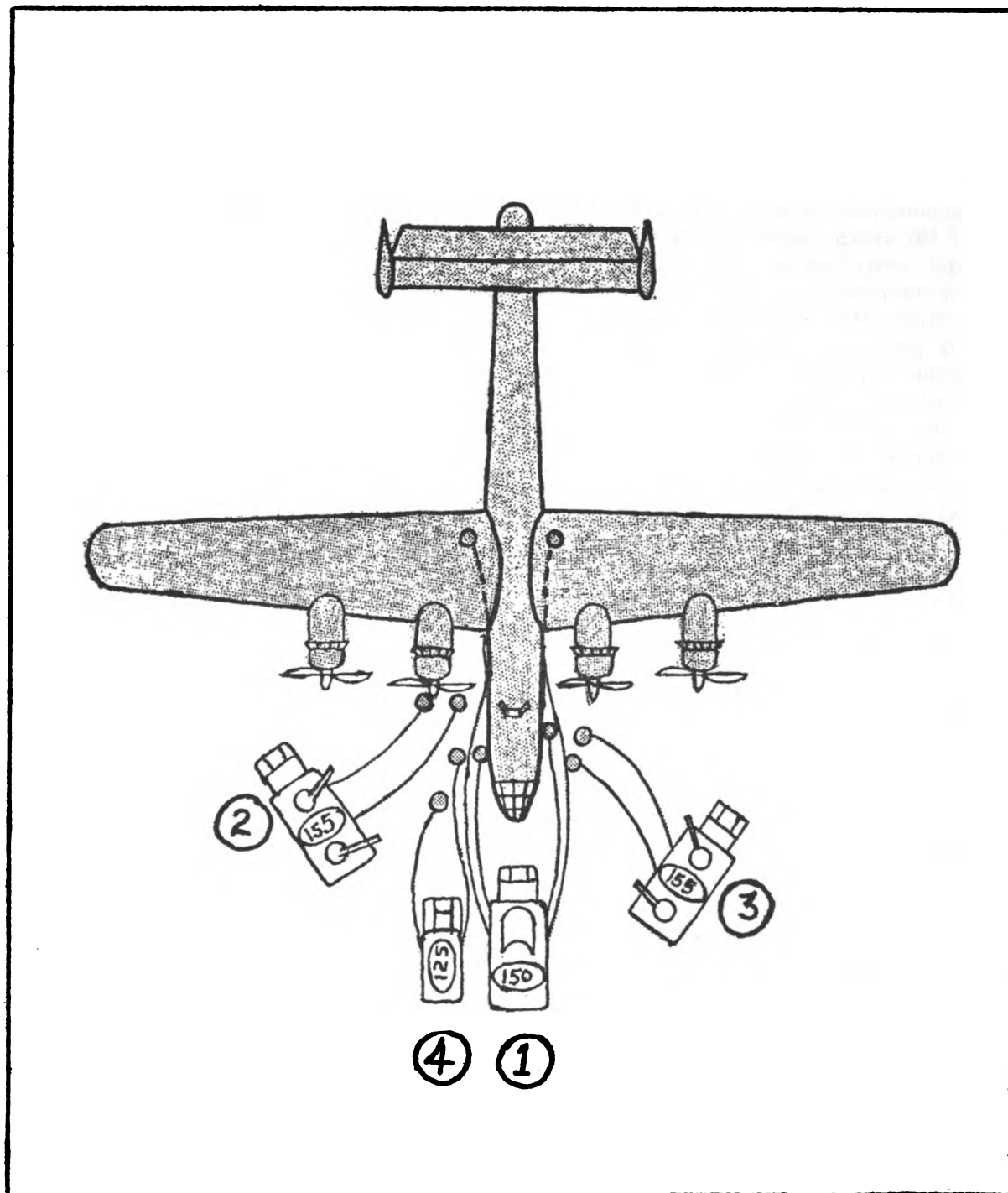


Figure 2.

Diagram showing the positioning of crash fire trucks on the nose of four-engine aircraft. Handlines will be set up as per the above diagram.

The LEFT HANDLINEMAN will position on the left side of his crew chief. The RIGHT HANDLINEMAN will position on the right side of his crew chief. The DRIVER-PUMP OPERATOR will perform his duties. The RESCUEMAN will perform his duties.

Your instructor, with your assistance, will demonstrate the approach, and positioning of the crash trucks and crews; attacking, and controlling fire around the fuselage section entering the aircraft through normal or forcible entry; releasing and removing of dummy personnel; stopping of the flow of fuel from ruptured fuel lines in the accessory section; extinguishing of ground fires at the top of the wing tanks; overhaul and preservation of evidence.

You will perform the operation as demonstrated by your instructor. The Class 155 Crash Truck will stand by for the discharging of gasoline. Fire will be present for this operation.

4. PRACTICAL PROCEDURE.

Your instructor will assign you to crews of 7 men on the Class 150 Crash Truck, 7 men on the Class 155 Crash Truck, and 5 men on the Class 125 Crash Truck. Your position on the truck will be designated and you will rotate positions until you have operated in various positions on all trucks used in this operation.

Three dummies will be placed at spots designated by the instructor. The drivers and other crew members will be on the alert for dummy personnel as they approach.

The crew on the Class 155 Crash Truck designated by the instructor will stand-by with pump running at full pressure while gasoline is being spilled for the training fire.

Your instructor will designate the area for the crash fire station from where the response will be made. The Instructor will designate whether the crashed aircraft is a cargo-type being used as a personnel carrier or a bombardment-type aircraft, and the sequence of the arrival of each crash truck.

Your instructor will signal for the response.

You will make a head-on approach, and position on the nose of a four-engine cargo-type aircraft, and perform release and removal of air crew casualties. You will stop the flow of fuel from the engine accessory section, extinguish the wing tank fire, make the overhaul, and preserve the evidence.

The fire around the fuselage section will be controlled until the instructor signals for the flow of fuel in the engine accessory section to be stopped.

After you have rescued the dummies and extinguished the fire, you will perform the overhaul and preserve any evidence that might have caused the crash and/or fire and report it to your instructor.

You will assist in reloading the hose and equipment on the trucks.

The same basic procedure will be used on aircraft crashes not immediately resulting in fire as those crashes which do result in fire.

EVALUATION (Self).

- (1) What advantage does the Class 155 Crash Truck have over the Class 125 Crash Truck when approaching burning and/or crashed aircraft?
- (2) What is the position of the first Class 155 Crash Truck to arrive?
- (3) Where is the best spot to position on cargo-type aircraft?
- (4) Why is it best to position on the tail of a four-engine bombardment-type aircraft?
- (5) On which side of the fuselage are the most normal exits located on four-engine cargo-type aircraft?
- (6) Where does the plugging operation start when two or more engines require plugging of ruptured or broken fuel lines?
- (7) Why does the initial attack and control of fire always start with the fuselage?

5. CRITIQUE.

Your instructor will conduct a critique of this training project and summarize the following key points:

- (1) Approaching four-engine cargo and bombardment-type aircraft.
- (2) Positioning of crash trucks and crews on four-engine, cargo and bombardment-type aircraft.
- (3) Attacking and controlling the fire around four-engine type aircraft.
- (4) Entering aircraft through normal openings and/or by forcible means in four-engine type aircraft.
- (5) Releasing and removing air crew casualties from four-engine type aircraft under fire conditions.
- (6) Controlling ground fire and stopping the flow of fuel from ruptured fuel lines in four-engine type aircraft.
- (7) Extinguishing ground fire and extinguishing the fire at the top of the tanks on four-engine type aircraft.

You will assist in performing "driver's" maintenance on the trucks and equipment used in this training project, including the washing and polishing of the trucks.

7. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student make the proper approach?			
2. Did the front turret operator open the turret when within the proper range?			

Grading points	Above average + 1	Average 0	Below average - 1
3. Did the driver position the Class 155 Crash Truck at a near diagonal?			
4. Did the driver position the Class 155 Crash Truck using the head-on position?			
5. Did the driver position the Class 125 Crash Truck properly using head-on position?			
6. Did the crew chief position the handlinemen properly for the initial attack?			
7. Did the rescueman select the proper forcible entry tool called for by the instructor?			
8. Did the crew chief position the handlinemen properly when stopping the flow of fuel from the accessory section?			
9. Did the handlineman position the flat pattern properly when extinguishing the top of the wing tank fire?			
10. Did the pump operator continuously check the pump and the extinguishing agent on the Class 125 and the Class 155 Crash Trucks?			

HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWEY AIR FORCE BASE, DENVER, COLORADO

DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH

SIX-ENGINE CRASH FIRES



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

The procedures for the approach and positioning of the crash trucks on six-engine aircraft.

The procedures for the initial attack and control of fire around the fuselage section.

The procedure for performing forcible entry under fire conditions.

The procedure for releasing and removing air crew casualties under fire conditions.

The procedure for stopping the flow of fuel from ruptured fuel lines in the accessory sections of six-engine aircraft.

The procedure for the extinguishment of the ground fires around the aircraft and the top of the wing tanks.

2. EQUIPMENT.

Two Class 155 Crash Trucks fully equipped.

Two Class 150 Crash Trucks fully equipped.

One Class 125 Crash Truck fully equipped.

Fifteen dummies, including parachute harness and safety belts.

Six trainers, wing tank fires, 5 feet high.

One salvaged six-engine aircraft.

3. INFORMATIONAL PROCEDURE.

Read the following information:

The B-36 aircraft is the largest aircraft in the United States Air Force. It is a constant threat to potential enemies of the United States and is a challenge to you, the crash rescueman. The B-36, due to its enormous size, number of personnel, and great fuel capacity, requires, more than ever, in the event of a crash, efficiency and team work from the crash crews when performing their duties in rescuing entrapped air crew personnel.

The designers of this great aircraft have taken into consideration every safety factor possible such as the crew positions for crash landings, and the design and the position of emergency exits. On an anticipated crash

landing, the crew will be stationed in the forward part of the nose section. This section has seven emergency exits that will enable you as a crash rescueman to remove air crew members faster than would otherwise be possible. If the crash should occur during the take-off, crew members will be at their normal stations, which are 9 forward of the wing and 5 aft.

APPROACH. The approach on the B-36 aircraft should be made on the nose.

POSITIONING. The positioning on the B-36 should be made on the nose and as close as possible, being consistent with good judgment, wind direction, terrain features, and extent of the spill area.

ATTACK. In the initial attack formation, both sides of the aircraft are attacked at the same time by a single crash truck. This attack is established by the crew chief. The linemen will position themselves on each side of the crew chief and progress forward under his directions. Additional equipment and crash crews will set up on the initial attack and enlarge upon the pattern.

EVALUATION (Self).

- (1) How many personnel does the B-36 carry?
- (2) Why should the crash crews be more efficient in regard to the B-36?
- (3) What was taken into consideration in the designing of the B-36 aircraft in regard to the crash crews?
- (4) How many exits are there in the forward section of the nose?
- (5) Where are the air crew members stationed on the take-off?
- (6) Where will the air crew be positioned on an anticipated crash landing?
- (7) Where do you make the initial approach and position of the crash trucks on the B-36?
- (8) What is meant by the initial attack formation of a single crash truck?

See diagram number 1 for the initial attack formation.

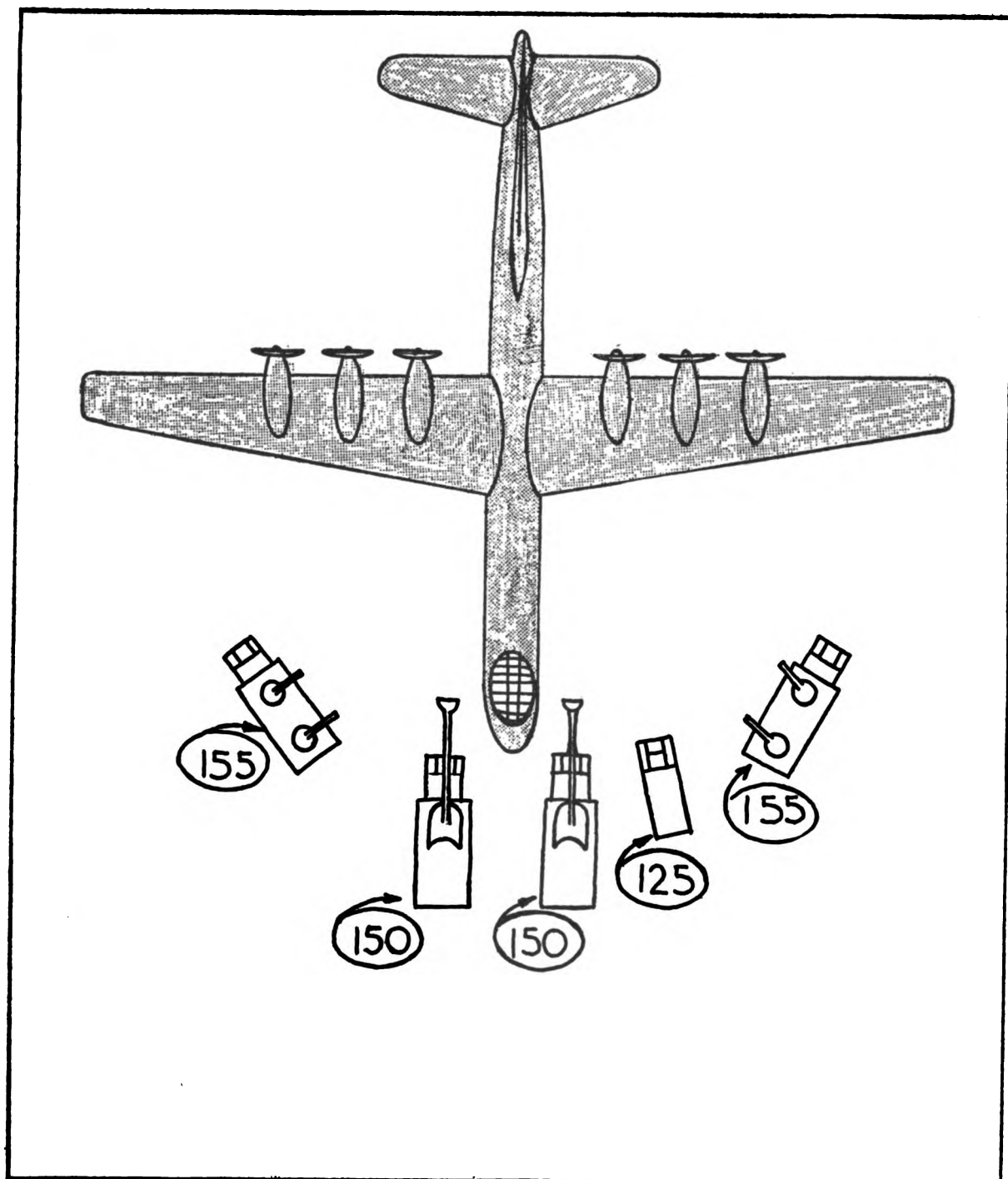


Figure 1. Positioning of equipment.

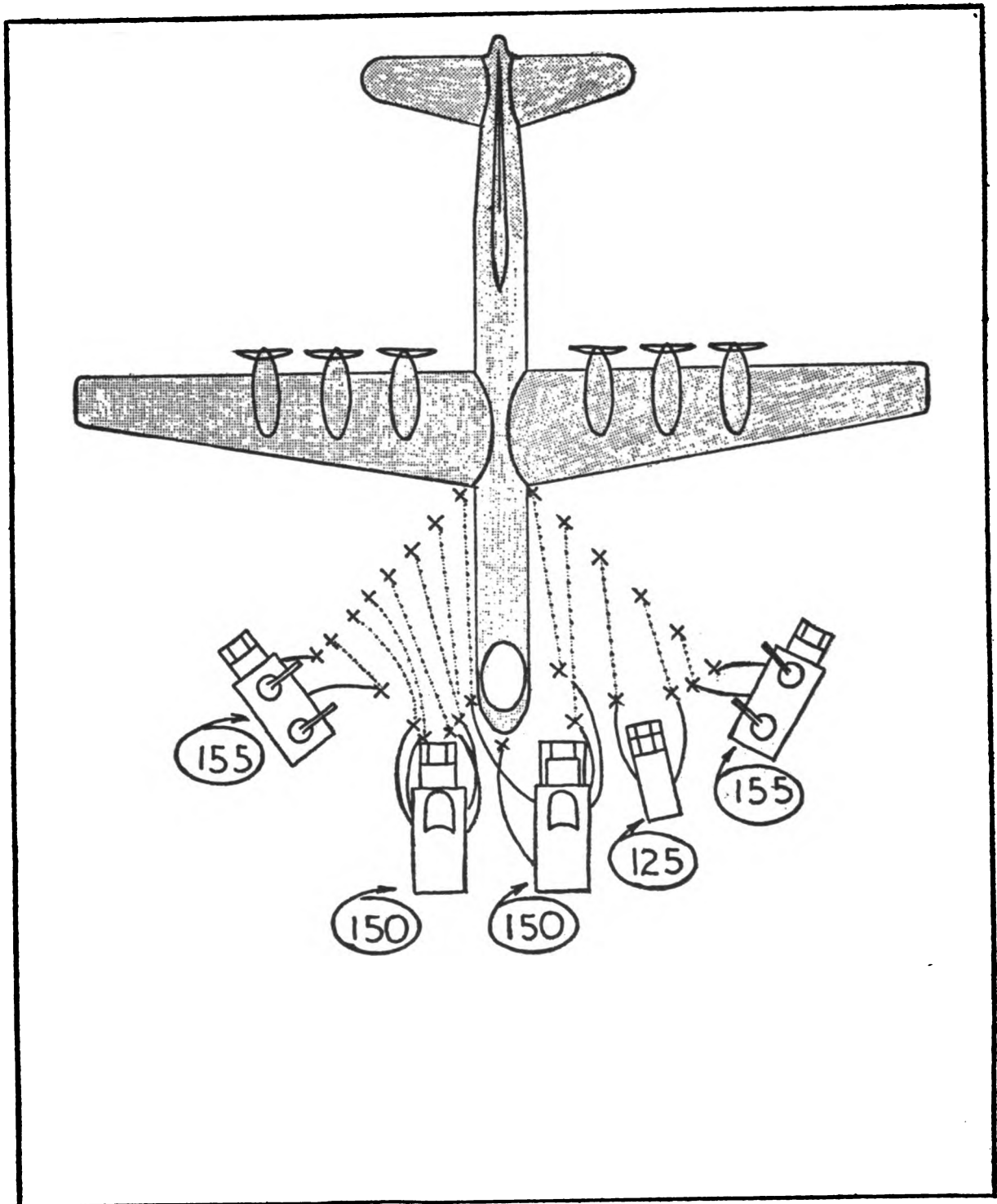


Figure 2. Initial attack formation.

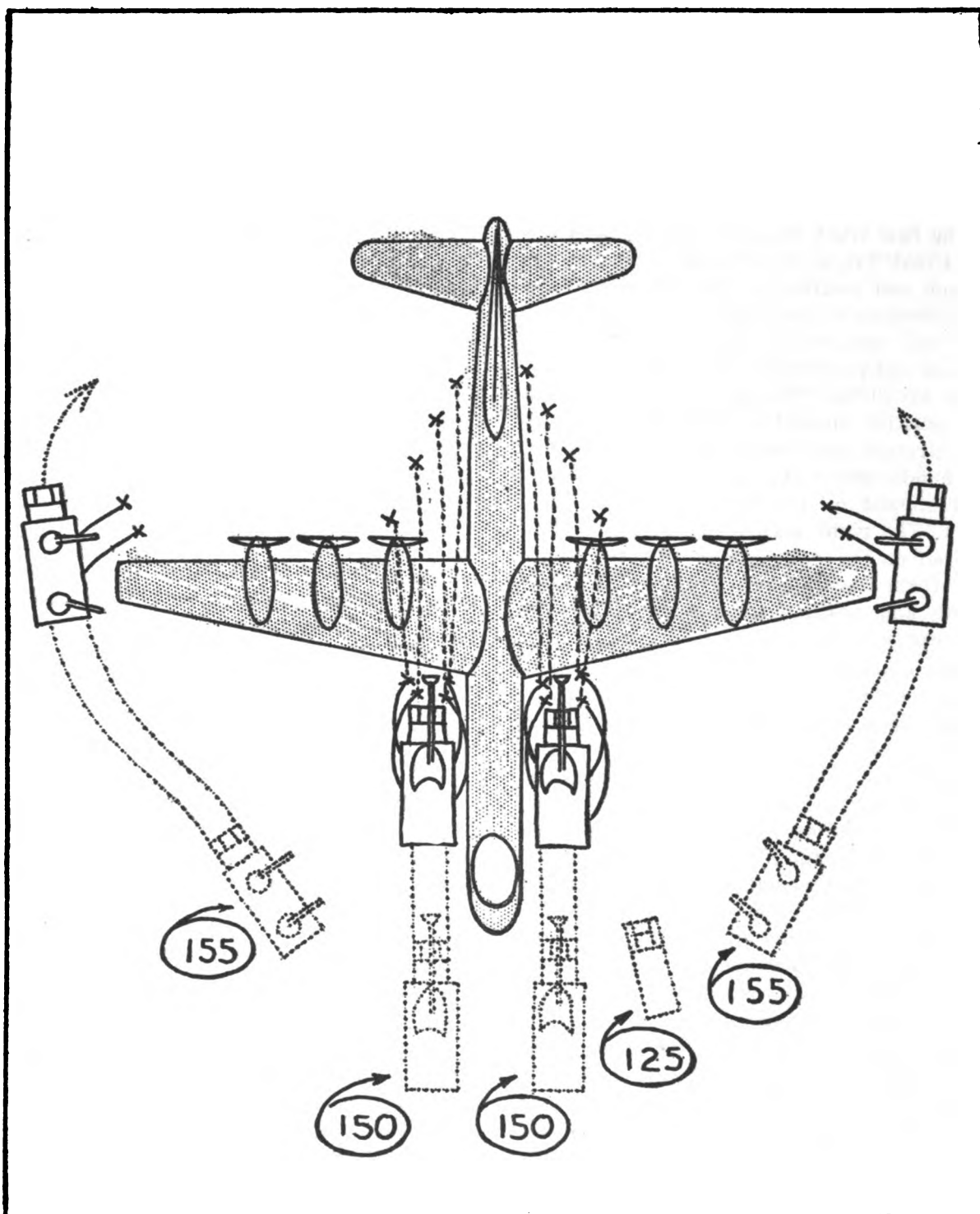


Figure 3. Advancing initial attack formation.

INITIAL POSITIONING OF CRASH TRUCKS AND HANDLINEMEN ON THE SIX-ENGINE AIRCRAFT (NOSE APPROACH).

Your instructor, with your assistance, will demonstrate the approach, the positioning, and the attack formation of crash trucks and crews on the B-36 aircraft. (NOTE: No fire will be present.)

The first truck to arrive will be the Class 150 Crash Truck. It will make a head-on approach and position on the left side of the nose, head-on to the aircraft. The panel operator will perform his duties during the approach and positioning. The driver will perform his duties. The crew chief will alight and position himself in front of the nose of the aircraft and direct the positioning of the handlinemen. The playpipeman will position himself on the left side of the crew chief. The right playpipeman will position himself on the right side of the crew chief. The foam handlinemen will perform their duties and position themselves behind the playpipemen.

The second truck to arrive also will be a Class 150 Crash Truck. It will make a head-on approach and position on the right side of the nose head-on to the aircraft. The panel operator will perform his duties during the approach and positioning. The driver will perform his duties. The crew chief will position himself on the left side of the fuselage. The right playpipeman will position on the right side of the crew chief. The left playpipeman will position on the left side of the crew chief. The right and left foam linemen will position themselves behind the playpipeman and perform their duties.

The third truck to arrive will be the Class 125 Crash Truck. It will position head-on to the aircraft, on the right side of the first Class 150 Crash Truck. Crew members will perform their duties and enlarge upon the pattern on the right side of the fuselage.

The fourth truck to arrive will be a Class 155 Crash Truck. It will make a head-on approach and position at a near diagonal on

the right side of the fuselage. Crew members will assist in controlling the area under direction of the crew chief.

The fifth truck to arrive will be a Class 155 Crash Truck. It will make a head-on approach and position at a near diagonal on the left side of the fuselage. Crew members will assist in controlling the area under the direction of the crew chief.

You will perform the operation as demonstrated by your instructor, including release and rescue of personnel.

To control and extinguish the fire it will be necessary to move crash trucks to different positions with the exception of the Class 125 Crash Truck. It will remain in its original position and control the immediate area. The crew chief will notify and/or reposition the handlinemen before attempting to move the equipment.

EVALUATION (Self).

- (1) Why is it necessary to move the crash equipment to control and extinguish the fire?
- (2) What crash truck is not moved during the control and extinguishment of the fire?
- (3) What are the crew chief's duties before the trucks can be moved?

ADVANCE ATTACK FORMATION OF CRASH TRUCKS AND HANDLINEMEN ON SIX-ENGINE AIRCRAFT.

See diagram number 2 showing positioning of crash trucks on the nose of the B-36 aircraft.

Your instructor, with your assistance, will demonstrate moving crash trucks and crews to accomplish the control and extinguishment of the fire. (NOTE: No fire will be present.)

The crew chief will notify the handlinemen where the trucks will be moved. The left playpipeman will, with the assistance of the crew chief, move from the right side to the left side of the fuselage.

The drivers will place the Class 155 Crash Trucks in first gear and drive slowly to the end of the wing tips. When signalled by in-

structor, the handlinemen will advance with the truck, disturbing the foam blanket as little as possible. Rescueman will hold the lines away from the truck wheels to prevent the truck passing over the hoses.

The drivers on the Class 150 Crash Trucks will drive slowly to the point designated by instructor. The handlinemen will advance with the truck, keeping lines clear of the truck wheels and disturbing the foam blanket as little as possible.

After ruptured lines and wing tanks have been controlled, the Class 155 Crash Trucks will continue around the aircraft, extinguishing the remaining fire and cooling the fuselage as directed by the instructor.

You will perform the operation demonstrated by your instructor.

4. PRACTICAL PROCEDURE.

Your instructor will assign you to a crew of 7 men on the Class 150 and Class 155 Crash Trucks and a crew of 5 men on the Class 125 Crash Truck. Your position on the truck will be designated. You will rotate positions until you have operated in the various positions on the trucks used in this operation.

Four dummies will be placed at locations designated by the instructor. The drivers and other crew members will be watching for dummy personnel on the approach.

The designated crew on the Class 155 Crash Truck will stand by, with pump running at full pump pressure, during the discharging of the gasoline for the training fire.

Your instructor will designate the area for the simulated crash fire station from where the response will be made.

Your instructor will designate the sequence for the arrival of the equipment.

No person other than the instructor will ignite the gasoline.

The instructor will signal for the response.

The fire around the fuselage will be controlled until the instructor signals for the fuel in the engine accessory sections to be stopped.

After you have rescued the personnel and extinguished the fire, you will perform the

overhaul and the preservation of evidence that might have caused the crash and/or fire, and report it to your instructor. You will assist in reloading the hose and equipment on the crash trucks.

The same procedure will be used on aircraft crashes not immediately resulting in fire as those crashes which do result in fire.

EVALUATION (Self).

- (1) Where is the initial attack and positioning made on the B-36?
- (2) How many escape points are located in the nose section?
- (3) How many crew members are assigned on the B-36 aircraft?
- (4) What is the position of the first arriving truck?
- (5) What safety precautions must be considered when moving trucks around aircraft to control and extinguish the fire?

5. CRITIQUE.

Your instructor will conduct a critique of this training project and summarize the following key points:

- (1) Approach and positioning of the crash trucks and crews on the B-36 aircraft.
- (2) The procedure for the initial attack and control around the fuselage.
- (3) The procedure for performing forcible entry under fire conditions.
- (4) The procedure for release and rescue of crew members from the B-36 aircraft under fire conditions.
- (5) The procedure for stopping the flow of fuel.
- (6) The procedure for moving the equipment, around the aircraft to extinguish the ground fire.
- (7) The procedure for extinguishing wing tank fires.
- (8) The procedure for overhaul and the preservation of evidence.

You will perform "driver's" maintenance on the equipment used in this training project, including washing and polishing.

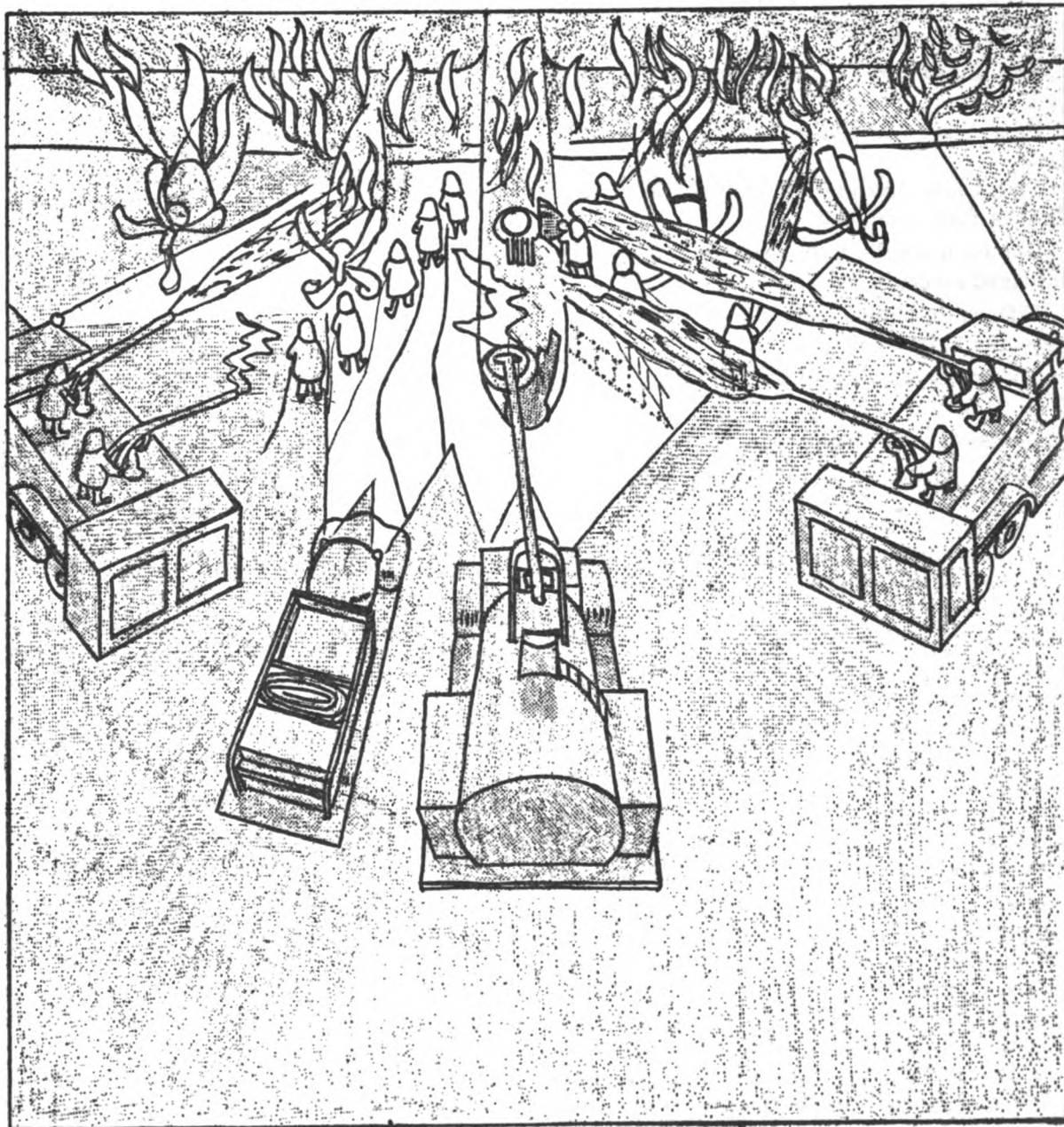
6. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student make the proper approach?			
2. Did the turret operators open the turrets when within range of the aircraft?			
3. Did the student continuously control the fire around the fuselage section?			
4. Did the turretmen shut off the nozzles when signaled by the instructor?			
5. Did the panel operator shut off the CO ₂ and foam when signaled by the instructor?			
6. Did the rescueman hold the hoseline away from the truck wheel while the truck was moving?			
7. Did the drivers move the trucks in first gear?			
8. Did the drivers watch for dummy personnel on the approach?			
9. Did the rescueman release the dummy before removing it?			
10. Did the turret operators work from the fuselage outward in controlling fire in the fuselage section?			

**HEADQUARTERS, 3415TH TECHNICAL TRAINING GROUP
LOWRY AIR FORCE BASE, DENVER, COLORADO**

**DEPARTMENT OF FIRE FIGHTING AND CRASH RESCUE TRAINING
CRASH RESCUE FIRE FIGHTING BRANCH**

**RESCUE OF PERSONNEL
FROM SINGLE, TWO, FOUR, AND SIX-ENGINE AIRCRAFT
OPERATING UNDER RIGHT CONDITIONS**



FOR TRAINING PURPOSES ONLY

1. OBJECTIVE.

To teach you:

The procedure for operating under night conditions.

The precautionary measures to be employed while working under night conditions.

The procedure for removing entrapped personnel from burning and/or crashed aircraft under night conditions.

Utilization of lighting equipment.

2. EQUIPMENT.

Two Class 110 Crash Trucks fully equipped.

Four Class 125 Crash Trucks fully equipped.

Two Class 150 and two Class 155 Crash Trucks fully equipped.

One each single, two, four, and six-engine salvaged aircraft.

Fifteen dummies, including parachute harness and safety belts.

Six trainers, wing tank and engine fires, 5 feet high.

One mobile floodlight unit.

3. INFORMATIONAL PROCEDURE.

a. Read the following information:

In previous training project outlines, you have been instructed in the rescue of entrapped personnel from the various sizes of aircraft. In this training project, you will perform the same operations. The primary difference is that these assignments will be effected under night conditions.

The fire at night may look much larger than it will during the day, and the person who knows little or nothing about crash fire fighting would think it is more hazardous. The fire at night, however, is no more hazardous to experienced personnel than is the day fire. When a crash occurs at night without immediately resulting in fire, the head-on approach and the head-on positioning will be of great help. It will aid in locating the spill area and the air crew. The head-on positioning also aids in the overhaul and preservation of evidence because the fire, if any, will

be out during the overhaul operation. You will be able to do this job better with the aid of the crash truck headlights and the auxiliary lighting equipment.

EVALUATION (Self).

- (1) How do fires at night differ from those during the day?
- (2) How does the head-on approach aid crash crews when working under night conditions?
- (3) How will the head-on positioning aid in determining the spill area when there is no fire?

4. PRACTICAL PROCEDURE.

You will perform the rescue and extinguishment operation on single, two, four, and six-engine aircraft in the manner you previously have been taught.

SINGLE-ENGINE AIRCRAFT FIGHTER-TYPE. Your instructor will assign you to a crew of 7 men on the Class 155 and a crew of 5 men on the Class 125 and Class 110 Crash Trucks. Your position on the truck will be designated. Two dummies will be placed near the fire area in the path of the approach.

The crew on the Class 155 will stand by for the gasoline spill with the pump running at full pressure.

Your instructor will designate the area for the crash fire station from which the response will be made, and signal for the response.

TWO-ENGINE AIRCRAFT (BOMBARDMENT-TYPE). You will be assigned to crews on the Class 150, Class 155, and Class 125. Your position will be designated.

The crew on the Class 155 will stand by for the gasoline spill with the pump running at full pressure.

Your instructor will designate the area for the crash fire station from where the response will be made, and signal for the response.

FOUR-ENGINE AIRCRAFT (BOMBARDMENT-TYPE). You will be assigned

to crews on the Class 155, Class 150, and the Class 125. Your position will be designated.

The crew on a Class 155 will stand by for the gasoline spill with the pump running at full pressure.

Your instructor will designate the area for the crash fire station from where the response will be made, and signal for the response.

SIX-ENGINE AIRCRAFT. You will be assigned to crews on the Class 155, Class 150, and the Class 125. Your position will be designated.

The crew on the Class 155 will stand by for the gasoline spill with the pump running at full pressure.

Your instructor will designate the area for the crash fire station from where the response will be made, and signal for the response.

EVALUATION (Self).

- (1) Why is the approach more hazardous at night than during the day?
- (2) How is the rescueman aided in his operation by the head-on positioning of the crash trucks?
- (3) How do night conditions affect your approach?
- (4) Why does the fire seem larger at night than during the day?
- (5) Why should the rescueman be more cautious when making the overhaul at night than during the day?

5. CRITIQUE.

Your instructor will conduct a critique of this training project and summarize the following key points:

- (1) Approach and positioning on single, two, four, and six-engine aircraft under night conditions.

- (2) Initial attack, forcible entry, release and removal of dummy personnel under night conditions.
- (3) Control of ground fires, stopping the flow of fuel, extinguishing ground and wing tank fires under night conditions.
- (4) Overhaul and preservation of evidence under night conditions.

You will perform "driver's" maintenance on crash trucks and equipment used in this training project, including the washing and polishing of the trucks.

6. GRADING POINTS.

Grading points	Above average + 1	Average 0	Below average - 1
1. Did the student make the proper approach and positioning of the crash truck?			
2. Did the student use the correct procedures on the initial attack?			
3. Did the student use caution in releasing and rescuing personnel?			
4. Did the panel operator apply the extinguishing agent on the approach?			
5. Did the drivers move the trucks in first gear when extinguishing in the area of burning six-engine aircraft?			
6. Did the student perform the overhaul after each operation?			
7. Did the student properly replace the equipment on the crash trucks after each operation?			



